

FINAL REPORT

Emulsified Zero-Valent Nano-Scale Iron Treatment of Chlorinated Solvent DNAPL Source Areas

ESTCP Project ER-0431

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LIST OF ACRONYMS

1,1-DCE	1,1-dichloroethene
1,1,1-TCA	1,1,1-trichloroethane
1,2-DCE	1,2-dichloroethene
cDCE	cis-1,2-dichloroethene
CMT	Continuous multichannel tubing
Dem/Val	Demonstration/Validation
DHGs	Dissolved hydrocarbon gases
DNAPLs	Dense Non-Aqueous Phase Liquids
DO	Dissolved oxygen
DoD	Department of Defense
DoE	Department of Energy
DOT	Department of Transportation
ECD	Electron capture detector
ESTCP	Environmental Security Technology Certification Program
EZVI	Emulsified Zero-Valent Iron
ft	Feet
ft amsl	Feet above mean sea level
ft bgs	Feet below ground surface
g	Grams
Gal	Gallons
gpm	Gallons per minute
HDPE	High-density polyethylene
IPT	Integral pump test
ISCO	In-situ chemical oxidation
K	hydraulic conductivity
kg	kilograms
LC34	Launch Complex 34
MCL	Maximum contaminant level
mg	milligrams
mg/L	Milligrams per liter
MCL	Maximum contaminant level
MCRD	Marine Corps Recruit Depot
MIP	Membrane interface probe
MWR	Moral, Welfare, and Recreation
mV	Millivolts
NaMnO ₄	Sodium permanganate
NASA	National Aeronautics and Space Administration
NAVFAC ESC	Naval Facilities Engineering Command's Engineering Service Center
NPV	Net present value
nZVI	Nano-scale ZVI
O&M	Operation and Maintenance
O.D.	Outside diameter
ORP	Oxidation-reduction potential
P&T	Pump-and-treat

PAHs	Polycyclic aromatic hydrocarbons
PCE	Tetrachloroethene
PRBs	Permeable reactive barriers
psi	Pounds per square inch
PTA	Pilot test area
PVC	Polyvinyl chloride
QAPP	Quality Assurance Project Plan
RI	Remedial investigation
RI/RFI	Remedial Investigation/RCRA Facilities Investigation
ROI	Radius of influence
SCDHEC	South Carolina Department of Health and Environmental Control
SAP	Sampling and Analysis Plan
STTR	Small Business Technology Transfer
SWMU	Solid Waste Management Unit
TCE	Trichloroethene
tDCE	trans-1,2-dichloroethene
TIC	Total inorganic carbon
TOC	Total organic carbon
UIC	Underground injection control
USEPA	United States Environmental Protection Agency
VC	Vinyl chloride
VFAs	Volatile fatty acids
VOCs	Volatile organic compounds
µg/L	Micrograms per liter
ZVI	Zero-Valent Iron

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1.0 INTRODUCTION

1.1 BACKGROUND

Chlorinated solvents are present in groundwater at an overwhelming number of Department of Defense (DoD), Department of Energy (DoE), and related contractor sites. A significant number of these sites have VOCs present as free-phase dense non-aqueous phase liquids (DNAPLs) that will act as a long-term source of VOCs to groundwater. Due to the slow dissolution of solvents from residual or pooled DNAPL source areas, conventional treatments such as pump-and-treat serve solely as containment technologies and require long operational periods (i.e., decades or longer) to satisfy the need for protection of human health and the environment, incurring high operation and maintenance (O&M) costs over that period.

Significant attention has been devoted in the past few years to research and field applications of source treatment technologies, as they have the potential to lower the overall cost and time required for remediation of contaminated aquifers. Recently, a small-scale field pilot test of emulsified zero-valent iron (EZVI) was conducted under the National Aeronautics and Space Administration (NASA) Small Business Technology Transfer (STTR) program to assess the ability of this technology to treat a Trichloroethene (TCE) DNAPL source zone. The pilot test showed promising results as a method for significantly reducing both mass and flux from DNAPL source zones. However, additional field demonstration research is required to improve the EZVI delivery approach, clarify the relative degradation contributions of the zero-valent iron (ZVI) versus biodegradation promoted by the emulsifying agents (completed laboratory evaluation; [Geosyntec, 2006a]), and validate the technology for widespread use for DNAPL source zone treatment at DoD and related private sectors sites. NASA holds the patent for this technology and, as a United States Government technology, no fees for the use of EZVI will be levied on any federal facility.

Through funding provided by the Department of Defense's Environmental Securities Technology Certification Program (ESTCP), and with support from the United States Environmental Protection Agency (USEPA) National Risk Management Research Laboratory, Geosyntec Consultants Inc. (Geosyntec) and NASA conducted a technology demonstration program evaluating the use of EZVI, an innovative remediation technology, to remediate chlorinated solvent DNAPL source zones. The field Demonstration/validation (Dem/Val) was conducted at the Solid Waste Management Unit (SWMU) 45 (Site 45) – Former Morale, Welfare, and Recreation (MWR) Dry Cleaning Facility, Marine Corps Recruit Depot (MCRD), Parris Island, South Carolina. The goal of the program was to evaluate degradation that is occurring due to abiotic and biological components as well as demonstrate the efficacy of EZVI at a scale that is large enough to generate accurate full-scale design and cost information for widespread technology consideration and application at DoD and related sites. This Final Technical Report presents the approach, methodology and results of the EZVI field Dem/Val. The laboratory treatability tests conducted to evaluate the biological and abiotic components of

degradation are presented in the Final Laboratory Treatability Report For: Emulsified Zero Valent Iron Treatment of Chlorinated Solvent DNAPL Source Areas (Geosyntec, 2006a).

1.2 OBJECTIVES OF THE DEMONSTRATION

The objectives of the field demonstration were to:

1. Evaluate the ability of the two most promising injection technologies to evenly distribute the EZVI in a controlled manner;
2. Evaluate the ability of EZVI to significantly reduce the mass flux of dissolved-phase VOCs from a DNAPL source zone and to reduce the DNAPL mass in the source;
3. Provide reliable technical data relevant to field-scale EZVI trials, including documenting the benefits of the technology in terms of expected reduction in the duration and cost of remediation of DNAPL sites, and develop a Guidance Manual to assist DoD managers and practitioners with appropriate selection and implementation of the EZVI technology; and
4. Provide information to the MCRD Partnering Team for use in the Feasibility Study for Site 45.

The field Dem/Val was conducted at SWMU 45 (Site 45) – Former MWR Dry Cleaning Facility, MCRD, Parris Island, South Carolina. This site has a relatively well-characterized DNAPL source area (primarily Tetrachloroethene [PCE]), and appropriate site conditions and a suitable on-site support network for execution of the Dem/Val. The rationale for the selection of the site is presented in the Draft Site Selection Memorandum For: Emulsified Zero-Valent Nano-Scale Iron Treatment of Chlorinated Solvent DNAPL Source Areas (Geosyntec, 2005).

1.3 REGULATORY DRIVERS

The USEPA maximum contaminant level (MCL) for PCE and TCE in drinking waters is 5 micrograms per liter ($\mu\text{g/L}$). This concentration is considerably less than the concentrations present in groundwater at many sites throughout the United States. The MCLs for vinyl chloride (VC) and cis-1,2-dichloroethene (cDCE) are 2 $\mu\text{g/L}$ and 70 $\mu\text{g/L}$, respectively. A significant number of sites have VOCs present as free-phase DNAPLs that will act as a long-term source of VOCs to groundwater. In situ technologies for treatment of these contaminants often focus on the groundwater plume and not the source of the contamination. Due to the slow dissolution of solvents from residual or pooled DNAPL source areas, conventional treatments serve solely as containment technologies and require long operational periods to remove significant amounts of DNAPL. Therefore, this demonstration seeks to further improve upon a more cost-effective technology that can meet these regulations and remediate DNAPL source areas.

2.0 TECHNOLOGY

The following sections provide a description of the technology (Section 2.1); discuss the technology development (Section 2.2); and outline the advantages and limitations of the technology (Section 2.3).

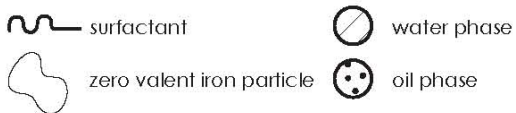
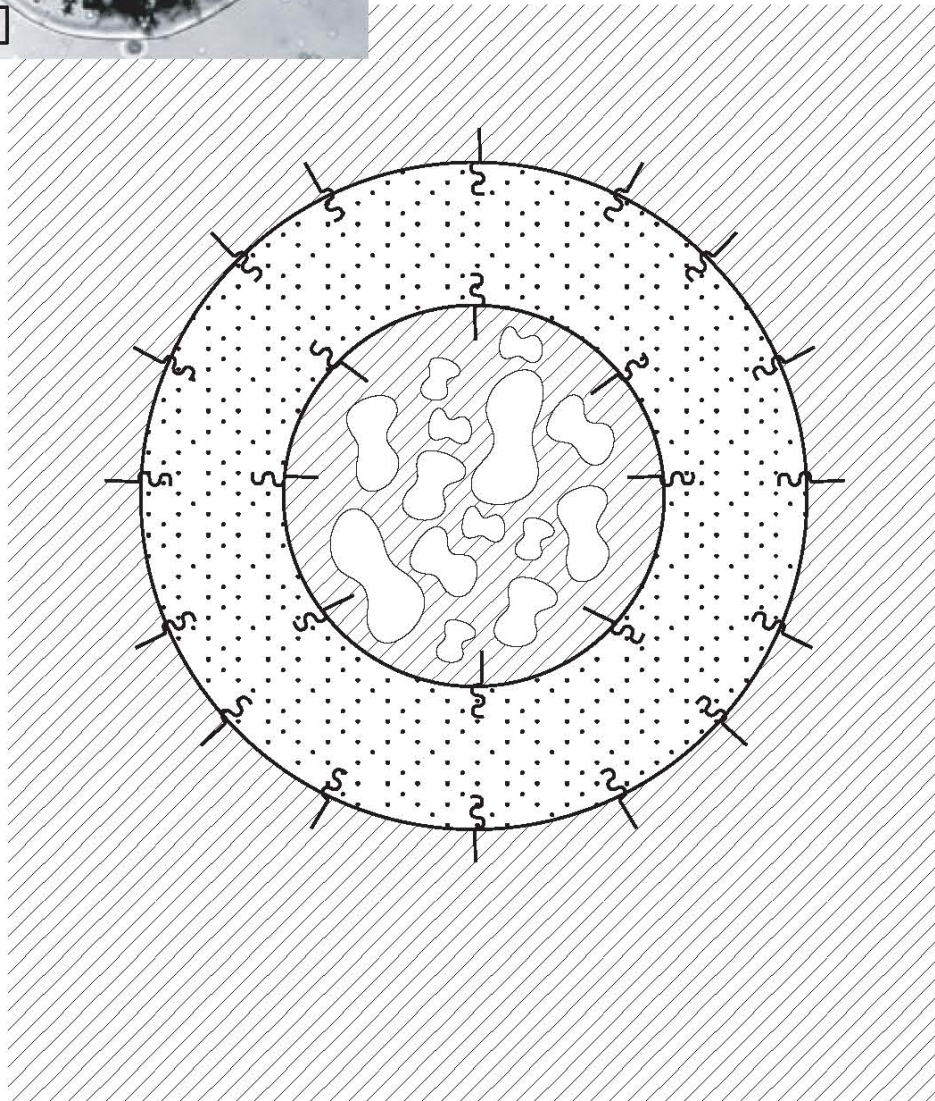
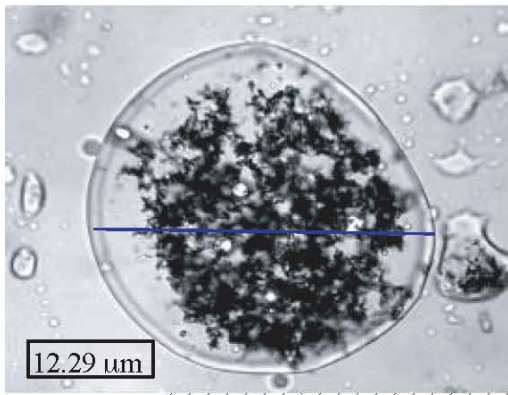
2.1 TECHNOLOGY DESCRIPTION

Significant laboratory and field research has demonstrated that zero-valent metals will reductively dehalogenate dissolved chlorinated solvents such as PCE and TCE to ethene. Permeable reactive barriers (PRBs) containing ZVI as the reactive material have been shown to be effective in treating plumes of dissolved chlorinated solvents. PRB technology is passive and requires no energy; however, it still relies on DNAPL dissolution and transport of dissolved chlorinated solvents to the barrier for treatment, and therefore PRBs do little to reduce the clean up time for the site.

EZVI can be used to enhance the destruction of chlorinated DNAPL in source zones by creating intimate contact between the DNAPL and the ZVI particles. The EZVI is composed of food-grade surfactant, biodegradable oil, water, and ZVI particles (either nano- or micro-scale iron), which form emulsion particles (Figure 2-1). Each emulsion particle or droplet contains ZVI particles in water surrounded by an oil-liquid membrane. Since the exterior oil membrane of the emulsion droplet has hydrophobic properties similar to that of DNAPL, the droplets are miscible with DNAPL. It is believed that as the oil emulsion droplets combine with DNAPL TCE, for example, the TCE is sequestered in the oil and then dissolves into the aqueous droplet containing ZVI that was within the oil emulsion droplet. It is also believed that the final degradation by-products from the dechlorination reaction are driven by the increase in concentration inside the aqueous emulsion droplet to diffusion into the non-aqueous phase (oil and TCE) then out into the surrounding aqueous phase. While the ZVI in the aqueous emulsion droplet remains reactive, the chlorinated compounds are continually degraded within the aqueous emulsion droplets, thus maintaining a concentration gradient across the oil membrane and establishing a driving force for additional TCE migration into the aqueous emulsion droplet where additional degradation can occur.

The primary application of the EZVI technology is treatment of DNAPL source zones but it is also capable of treating dissolved-phase chemicals. EZVI that is located near DNAPL will also degrade the dissolved-phase chemicals that it comes in contact with. The reduction in concentration of dissolved-phase chemicals in the vicinity of the DNAPL will enhance mass dissolution from the DNAPL.

In addition to the abiotic degradation associated with the ZVI, the injection of EZVI containing vegetable oil and surfactant will result in sequestration of the chlorinated ethenes into the oil and biodegradation of dissolved chlorinated ethenes. Chlorinated solvents will preferentially dissolve into the oil component of the EZVI thereby reducing the aqueous phase concentrations. The chlorinated solvents may then be degraded by the ZVI in the EZVI. The



**Schematic and Photo of Emulsion Droplet Structure
of the Emulsified Zero-Valent Iron**
Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
consultants

**Figure
2-1**

Guelph

November 2009

vegetable oil and surfactant can also act as electron donors to promote anaerobic biodegradation of the chlorinated solvents. Abiotic degradation resulting from the ZVI in the EZVI was shown to be a very fast process in laboratory studies conducted at the University of Central Florida (Quinn et al. 2005). If the amount of ZVI is not sufficient to completely degrade the TCE to ethene then the vegetable oil and surfactant can act as a slow release electron donor for biodegradation processes at the site (Major et al. 2002).

Another potential benefit of EZVI over ZVI for environmental applications is that the hydrophobic membrane surrounding the ZVI protects it from other groundwater constituents, such as some inorganic compounds, that might otherwise react with the ZVI. While the oil membrane of the EZVI will allow organic constituents (TCE and other ethenes) to diffuse through the liquid membrane and contact the ZVI, it may inhibit diffusion of other ionic constituents that may passivate the ZVI surface and limit their contact with the ZVI. This mechanism potentially reduces the mass of ZVI required for treatment relative to unprotected ZVI.

2.2 TECHNOLOGY DEVELOPMENT

The first field demonstration of EZVI was conducted between 2001 and 2003 to treat a chlorinated solvent source zone at NASA's Launch Complex 34 (LC34) located on the 45th Space Wing's Cape Canaveral Air Force Station. The demonstration conducted at LC34 demonstrated that the addition of EZVI into a source area containing free-phase DNAPL could reduce the mass flux of dissolved phase TCE from a DNAPL source zone, and reduce the amount of free-phase DNAPL mass over time. Although the field demonstration at LC34 was successful in showing a decrease in TCE mass flux and TCE DNAPL mass, there were issues with the EZVI injection techniques and in obtaining a uniform distribution of EZVI in the areas containing DNAPL.

NASA holds the patent on the technology and has successfully licensed the technology to six companies. EZVI has been injected at over 16 sites in the U.S. from 2004 until present, in a range of geologies including sandy site and fractured rock.

2.3 ADVANTAGES AND LIMITATIONS OF THE TECHNOLOGY

Groundwater remediation approaches at DNAPL sites have historically employed groundwater extraction and ex situ treatment (i.e., pump-and-treat [P&T]). Unfortunately, these approaches have been demonstrated to be ineffective in significantly improving groundwater quality, even after decades of continuous operation (National Research Council, 1994). As a result, remediation technologies such as EZVI have received significant attention, as government and industry struggle to develop remedial approaches for source treatment that are less intrusive, more effective, and less costly. The main advantages of the EZVI technology over other treatment technologies include:

- Potential for lower overall costs than alternative technologies such as groundwater pump-and-treat with high O&M costs or thermal technologies with high capital costs;
- An effective “one-two punch” of rapid abiotic degradation followed by the slower biological degradation;
- Contaminants will be destroyed rather than transferred to another medium; and
- Ability to treat both DNAPL source zones and dissolved-phase chemicals to contain plume migration.

The main limitations of using the EZVI technology are:

- Difficulty in effectively distributing the viscous EZVI to all areas impacted with DNAPL;
- Potential to adversely impact secondary groundwater quality through mobilization of metals and production of sulfides or methane if excess electron donor, in the form of the vegetable oil, is added; and
- Injection of EZVI may displace DNAPL away from the injection point; however, this limitation can be remedied by strategic placement of the injection points.

3.0 PERFORMANCE OBJECTIVES

The performance objectives are provided in Table 3-1. Each objective is discussed in detail in the following sections.

3.1 REDUCTION IN MASS FLUX OF VOCs IN DOWNGRADIENT WELLS

A key performance objective is a reduction in mass flux of dissolved VOCs in downgradient monitoring wells for areas in contact with EZVI. To evaluate this objective, groundwater and soil samples were collected both before and after EZVI injection and analyzed by method 8260B. Data from the post-demonstration sampling event are compared to data from the pre-injection (baseline) sampling event. Successful performance will be >75% decrease in mass flux of dissolved VOCs based on groundwater samples from multilevel wells over the baseline condition for areas in contact with EZVI.

This objective was met. There were significant reductions in the downgradient groundwater mass flux values for parent compounds PCE (> 85 %) and TCE (> 85 %) and a significant increase in the mass flux of ethene. These results are discussed further in Section 6.1.

3.2 REDUCTION IN TOTAL VOC AND DNAPL MASS

The amount of VOC and DNAPL reduction in the Pneumatic Injection test plot is assessed by comparing results of pre-injection (baseline) and post-injection groundwater and soil core samples. A successful performance will be >75% decrease in VOC and DNAPL mass over baseline conditions in the Pneumatic Injection test plot.

This objective was met with a total VOC mass reduction of 81%; an estimated reduction of 61% reduction in the sorbed and dissolved phases and 91% reduction in the DNAPL mass. These results are discussed further in Section 6.2.

3.3 RADIUS OF INFLUENCE

The radius of influence (ROI) of each injection technology was assessed through visual inspection of soil cores collected post-injection. For the Pneumatic Injection and Direct Injection test plots, success was marked by the presence of EZVI at distances greater than 5 feet (ft) and 1 ft, respectively.

This objective was met with measured ROIs of as much as 7 feet with pneumatic injection and 2.5 ft with direct injection. These results are discussed further in Section 6.3.

3.4 ABILITY TO INJECT EZVI WITHOUT DAMAGING EMULSION STRUCTURE

For this performance criterion, the injection technologies will be able to deliver the EZVI within the source zone without damage to the emulsion structure.

TABLE 3-1: PERFORMANCE OBJECTIVES
Parris Island, South Carolina

Geosyntec Consultants

Type of Performance Objective	Primary Performance Criteria	Expected Performance	Actual Performance Objective Met?
Qualitative	1) Ability to inject EZVI without damaging emulsion structure	Injection technologies will be able to deliver the EZVI within the source zone in a way that will not damage the emulsion	Objective Met
	2) Ability to evenly distribute EZVI in controlled manner over an optimum radius of influence	Injection technologies will be able to deliver the EZVI within the source zone in a way that will allow some control of the direction of EZVI injection so as to evenly distribute the EZVI over the injection interval	Objective Partially Met
	3) Implementability	EZVI will be relatively easy to handle and inject in the field with proper operator training	Objective Met
	4) Versatility	Technology can be applied in a variety of geological and hydrogeological settings where DNAPL source areas are present	Objective Met
	5) Duration of Remediation	Reduction of total VOC and DNAPL concentrations can be achieved within a short time frame (i.e., <9 months)	Objective Met
	6) Scale-up Constraints	Technology can be implemented at full scale at larger sites based on performance data from small scale demonstration	Objective Met
Quantitative	1) Reduction in mass flux of dissolved VOCs in downgradient monitoring wells in the Pneumatic Injection test plot; degradation also evaluated in the adjacent Direct Injection test plot, but this is secondary	>75% decrease in mass flux of dissolved chlorinated ethenes based on groundwater samples from multilevel wells over the baseline condition for areas in contact with EZVI	Objective Met
	2) Reduction in the total VOC and DNAPL mass in the Pneumatic Injection test plot	>75% decrease in VOC and DNAPL mass in the Pneumatic Injection test plot over baseline conditions based on groundwater samples and post-demonstration core samples for areas in contact with EZVI	Objective Met
	3) Radius of Influence (ROI)	For the Pneumatic Injection technology a ROI >5 ft. For the Direct Injection technology a ROI of >1 ft	Objective Met

This objective was met with both technologies being able to inject the EZVI without damage to the emulsion structure. These results are discussed in greater detail in Section 6.4.

3.5 ABILITY TO EVENLY DISTRIBUTE EZVI

The ability of each injection technology to evenly distribute EZVI in a controlled manner over an optimum ROI was assessed by collecting groundwater and soil core samples from the test plots. Success was marked by the ability of the injection technology to deliver the EZVI within the source zone in a way that will allow some control of the direction of EZVI injection so as to evenly distribute the EZVI over the injection interval.

This objective was partially met. There were complications with the shallow nature of the target injection interval and preferential flow paths created by previous borings in the area providing short circuit pathways for the EZVI to surface. These results are discussed in greater detail in Section 6.5.

3.6 EASE OF IMPLEMENTATION

The ease of use of this technology was evaluated based on our experience in the field.

This objective was met with respect to both the ease of making the EZVI up on site and with the handling and injection of the EZVI. These results are discussed in greater detail in Section 6.6.

3.7 VERSATILITY

For this performance criterion, the technology was deemed successful if it could be applied in a variety of geological and hydrogeological settings where DNAPL source areas are present.

This objective was met although there are some restrictions to the depth and geological settings in which the injection technologies tested can be applied. These results are discussed in greater detail in Section 6.7.

4.0 SITE DESCRIPTION

The field Dem/Val site selected by the screening process was Site 45 – Former MWR Dry Cleaning Facility (Building 193), MCRD, Parris Island, South Carolina (the “Site”) (Figure 4-1). The rationale for the selection of this site is presented in the Draft Site Selection Memorandum For: Emulsified Zero-Valent Nano-Scale Iron Treatment of Chlorinated Solvent DNAPL Source Areas (Geosyntec, 2005).

In the following sections, the site location and history (Section 4.1), site geology/hydrogeology (Section 4.2), and contaminant distribution (Section 4.3) are discussed. Information in the following sections is taken directly from the RI/RFI for Site/SWMU 45 report (Tetra Tech NUS, 2004a) as well as the Site/SWMU 45 RI/RFI Addendum Work Plan report (Tetra Tech NUS, 2004b).

4.1 SITE LOCATION AND HISTORY

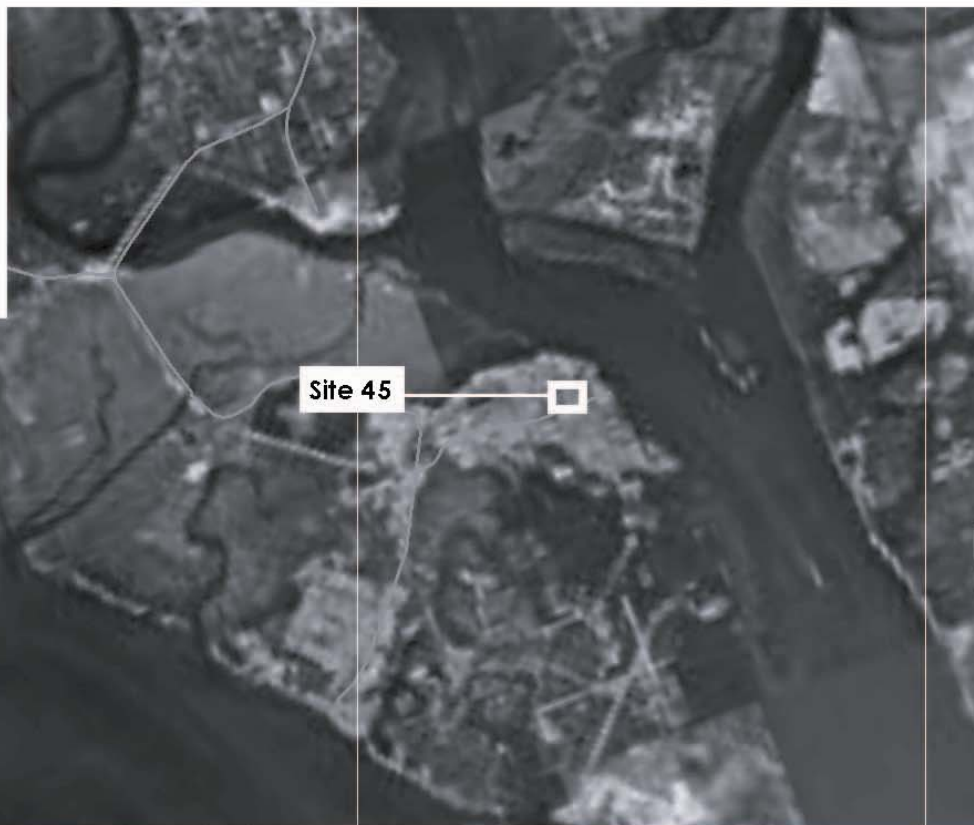
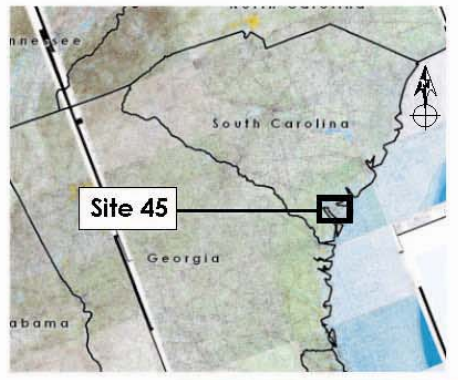
The Site is located in the Main Post area of MCRD Parris Island, between Panama Street to the north, Kyushu Street to the south, and Samoa Street to the east. The location of the pilot test area (PTA) at the Site is shown in Figure 4-2.

West of the Site are other commercial establishments including a cobbler, a tailor, and a coin-operated laundry facility. Four above ground storage tanks were situated along the northern side of former Building 193. The capacities of these tanks are not known. These tanks were first put into place in 1988 following the removal of an underground storage system where hydrocarbon-cleaning solvents were previously stored. The location and capacity of the underground storage system are not known. The new storage tanks were positioned within a concrete catch basin used to contain any overflow during tank filling. It was reported that on March 11, 1994, one of the tanks was overfilled with PCE. An unknown amount of the contaminant flowed into the concrete catch basin. The PCE overflow was not collected at that time, and heavy rainfall subsequently washed the contaminant onto the surrounding soil. The dates of operation of former Building 193 are not known (Tetra Tech NUS, 2004b).

4.2 SITE GEOLOGY/HYDROGEOLOGY

Four geological units are present in the area of the Site (Beaufort-Jasper County Area). These units from the oldest (Eocene age) to the youngest (Pleistocene age) are the Santee Limestone, Cooper Marl, Hawthorn Formation, and Pleistocene sands and clays. The geology of the Site is presented in further detail in the RI/RFI for Site/SWMU 45 report (Tetra Tech NUS, 2004a).

Two primary aquifers are present within the Beaufort-Jasper County Area: the surficial aquifer and the Floridan Aquifer. These aquifers are generally separated by the Hawthorn Formation and Cooper Marl, which act as confining units to the underlying Floridan Aquifer. In the MCRD Parris Island area, the shallow, unconfined aquifer generally consists of permeable,



Source: TerraServer.Com, and StreetMap USA (Copyright © 1999-2005 ESRI Inc.)

Site 45 Location at MCRD, Parris Island, South Carolina
 Site 45, Parris Island MCRD, Parris Island, SC

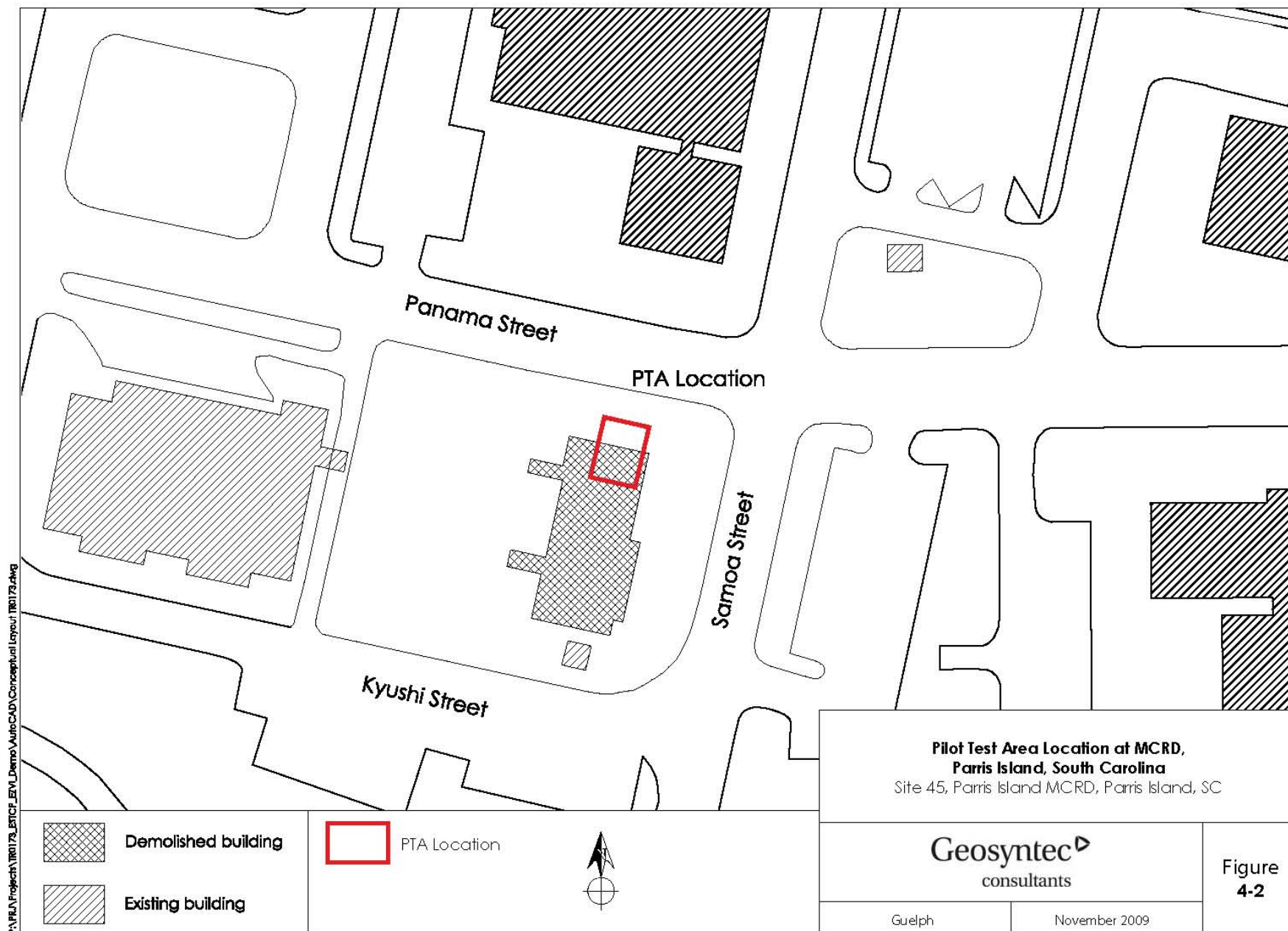
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**Figure
 4-1**

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Site location 175 of



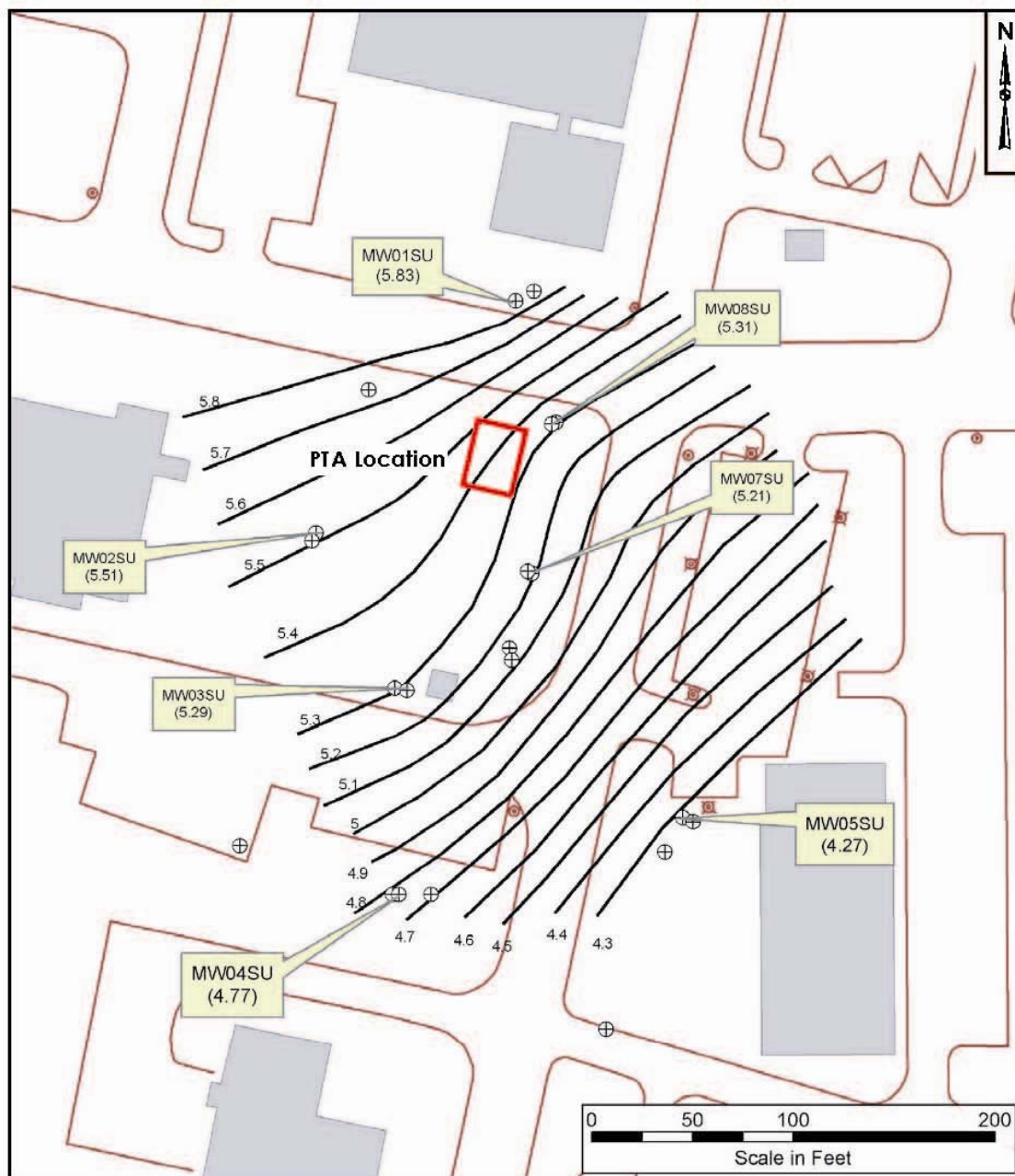
fine to medium, Pleistocene age sand to a depth of 17 ft. Surface relief is relatively low. Thin, discontinuous lenses of finer-grained silty clay and clayey sand were also encountered within the predominantly sandy sediments. During the Remedial Investigation/RCRA Facilities Investigation (RI/RFI), this layer was further divided into an upper (SU) and lower (SL) portion. A 1- to 3- foot thick layer of peat was encountered below the shallow aquifer sediments at depths ranging from 17 to 21 feet below ground surface (ft bgs). The peat was directly underlain by a 3- to 6-ft thick clay unit encountered at depths ranging from approximately 18 to 27 ft bgs. Beneath this peat/clay layer, the deep surficial aquifer consisted of unconsolidated deposits of primarily sand, clayey sand, and silty fine sand. The water table was observed at depths ranging from 3 to 5 ft bgs at monitoring wells during the RI/RFI investigation. Water-table elevations recorded during the RI/RFI investigation ranged from 3 to 4.5 ft above mean sea level (amsl). The general groundwater flow direction in the formation above the peat/clay layer is to the southeast. Potentiometric maps for the upper and lower portions of the shallow aquifer are presented in Figures 4-3 and 4-4, respectively. Estimates of the hydraulic gradient, hydraulic conductivity and groundwater velocity for the shallow aquifer are 0.0023 to 0.0029 ft/ft, 15.3 ft/day, and 0.15 to 0.18 ft/day, respectively. The general groundwater flow direction in the formation below the peat/clay layer is to the south-southwest, with a gradient of 0.0021. During the RI/RFI, the vertical gradient between wells in a cluster was observed to be negligible, typically less than 0.1 ft. The nearest surface water body is Ballast Creek, which lies approximately 2,000 ft south-southeast of the MWR Dry Cleaning Facility.

In the Beaufort-Jasper County Area, the Floridan Aquifer system occurs near land surface, and confining beds vary from essentially 0 to more than 150 ft in thickness. Two hydrogeologic zones within the Floridan Aquifer lie beneath the MCRD Parris Island area. These two hydrogeologic units consist of a 200-ft thick Upper Hydrogeologic Unit that contains an upper permeable zone and an 800-ft thick Lower Hydrogeologic Unit that has a somewhat lower permeability compared to the Upper Unit. A generalized geologic cross section of the subsurface geology at the Site is presented in Figure 4-5.

4.3 CONTAMINANT DISTRIBUTION

Based on the Site history, three locations were identified as possible sources of solvent contamination in the soils and groundwater. One location is the secondary containment drain for the raw PCE aboveground storage tanks (located north of the tanks). A documented spill of PCE and an interim soil cleanup occurred at this location in 1994. The second location is in the rear (west end) of former Building 193. Waste solvents may have been handled or accumulated in this area. No documented leaks or spills occurred in this location. The third location is within the northwestern corner of former Building 193, where the dry cleaning process was conducted. A concrete floor that would serve as secondary containment was noted in this area prior to building demolition. No documented leaks or spills occurred in this area.

PCE and its degradation products (TCE, cDCE, and 1, 2-dichloroethene [1,2-DCE] and VC) were detected in surface and subsurface soils and groundwater above screening levels in all three



Legend:

- ⊕ Monitoring Well
- MW08SL (5.32) Surficial Lower Monitoring Well (Groundwater Elevation)
- 5.7 Groundwater Elevation Contour (feet) June 17, 2003
- PTA Location

Source: NAVFAC South

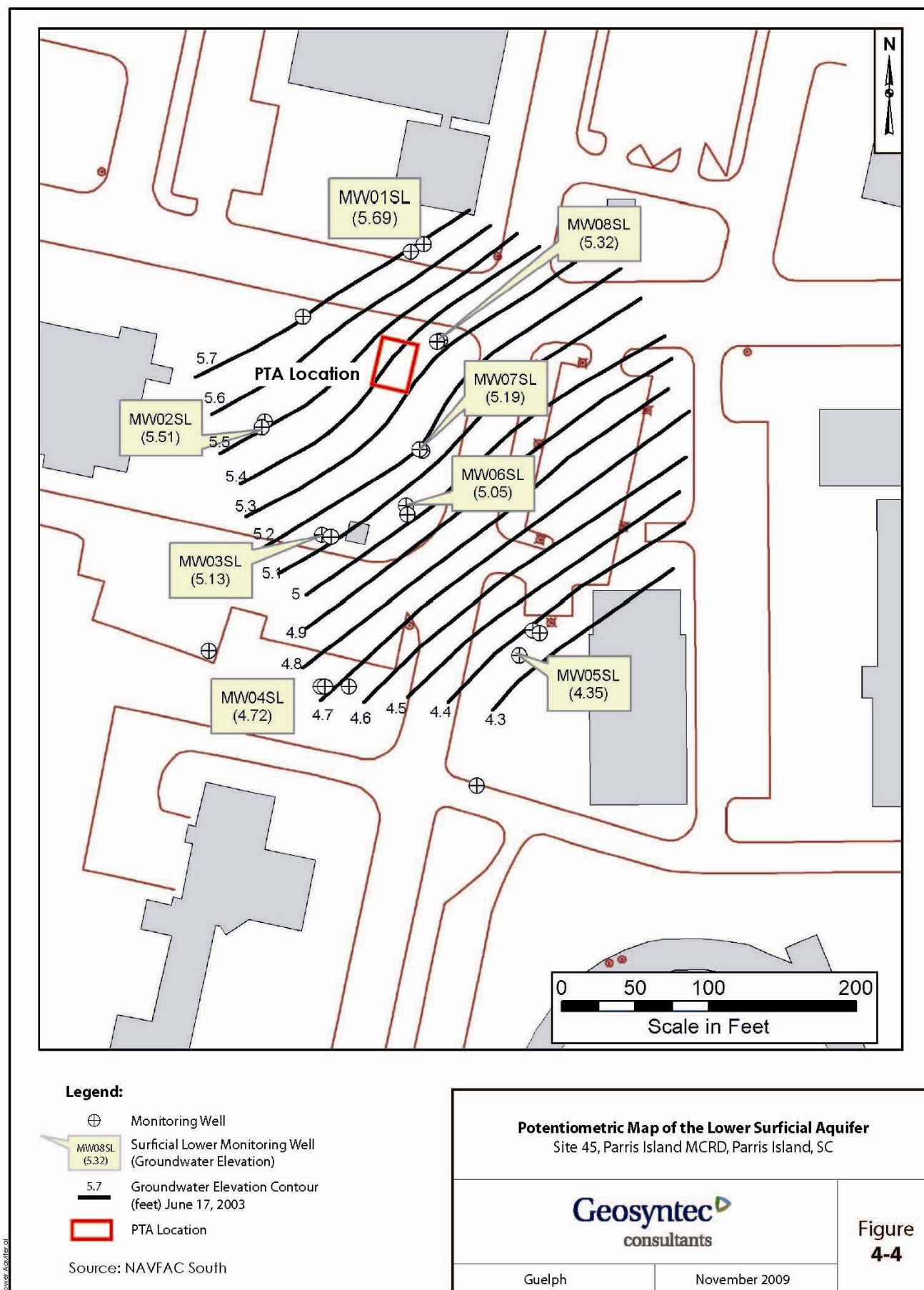
Potentiometric Map of the Upper Surficial Aquifer
Site 45, Parris Island MCRD, Parris Island, SC

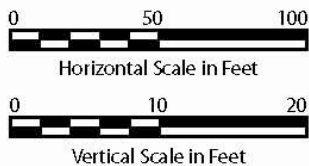
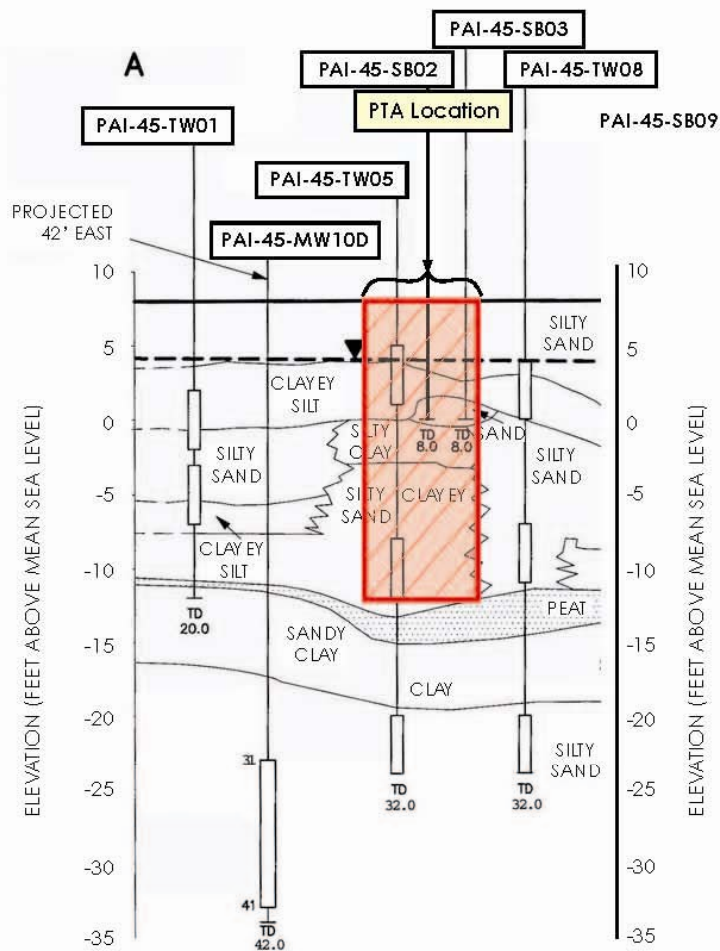
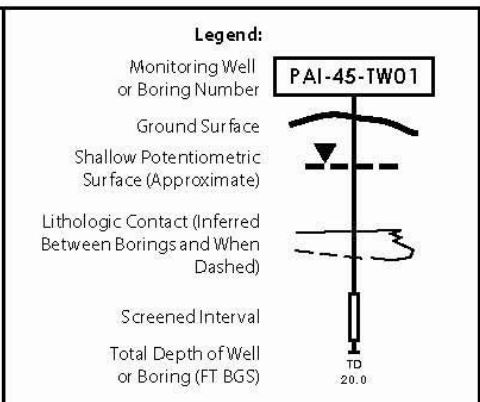
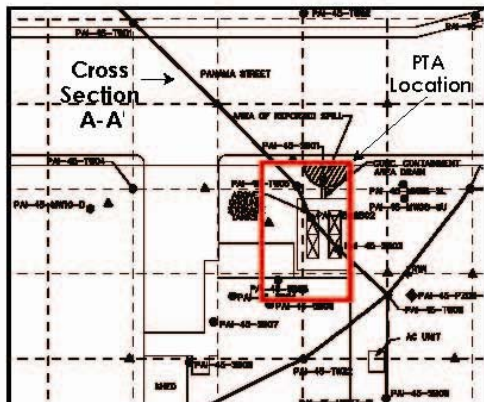
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Figure 4-3





Source: RI/RFI for site /SWMU45
(Tetra Tech NUS, 2004a)

Generalized Geologic Cross Section
Site 45, Parris Island MCRD, Parris Island, SC

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Figure 4-5

identified potential source areas during investigation prior to June 2005. Polycyclic aromatic hydrocarbons (PAHs) were detected in the soil sample locations across the Site but at relatively low concentrations compared to human health screening criteria. Rather subjective analysis by ultraviolet light for non-aqueous phase product was conducted for soils. The evaluation indicated possible trace amounts in isolated areas. However, the presence of pure product was not positively identified during site investigation prior to June 2005 and no further conclusions were developed. Results of the field sampling and analytical program suggest that the inorganic constituents detected in surface soils were similar to background conditions at MCRD Parris Island or at levels below human health screening criteria. Temporary and permanent monitoring well data indicate chlorinated VOC contamination in the surface and subsurface soil at the Site has impacted the groundwater (i.e., groundwater contaminant concentrations above screening levels) to depths ranging from the upper boundaries of the unconfined aquifer to approximately 19 ft bgs. Furthermore, investigations of the underlying deep aquifer found only limited VOC contamination, suggesting that the contaminant plume may be contained within the surficial aquifer. In other investigations (natural attenuation), elevated concentrations of some VOCs were detected downgradient of the "non-detect" contour depicting the current results (Tetra Tech NUS, 2004a).

In 1998, a groundwater pump-and-treat system was installed at the Site to prevent the migration of groundwater contaminants until a comprehensive remedial investigation (RI) could take place. The system consisted of three recovery wells located along the eastern side of the site, adjacent to Samoa Street, a low-profile air stripper for removal of VOCs, and a pumping system for discharging the treated groundwater to an adjacent sewer manhole for ultimate discharge to the Depot's wastewater treatment facility. Due to high maintenance requirements, the system was taken out of service in early 2000, and is currently not in operation (Tetra Tech NUS, 2004a; 2004b).

In June 2005, Geosyntec, NASA, the United States Naval Facilities Engineering Command's Engineering Service Center (NAVFAC ESC), and the USEPA conducted a field investigation to collect additional groundwater and soil data from the Site to confirm the results of the membrane interface probe (MIP) logs collected during prior investigations of the source area (Tetra Tech NUS, 2004b) and to confirm the presence of DNAPL concentrations of PCE and/or TCE in the subsurface in the area of the former tanks. Groundwater samples were collected from temporary monitoring wells that were installed at locations that had elevated electron capture detector signals from the previous MIP survey (Figure 5-1). Groundwater samples were collected from both the upper and lower portions of the shallow surficial aquifer above the peat/clay layer and analyzed for VOCs. The temporary well results and previous MIP measurements were used to select soil core locations (Figure 5-1). Soil cores from locations SC-1 through SC-8 were collected from ground surface to a depth of 20 ft bgs and were analyzed for VOCs using the methanol extraction procedure specified in Appendix D. Results of the June 2005 field investigation are presented in Appendix E (Tables E-1 and E-3).

Results of the June 2005 field investigation revealed PCE concentrations in soil cores that exceeded the maximum possible dissolved and sorbed phase PCE concentrations (based on site conditions), thereby indicating the presence of PCE DNAPL mass. Furthermore, visual inspection of soil cores collected during the June 2005 field investigation indicated the presence of DNAPL.

5.0 TEST DESIGN

5.1 PRE-DESIGN SITE INVESTIGATIONS

As discussed in Section 4.3 above, Geosyntec, NASA, the United States NAVFAC ESC, and the USEPA conducted a field investigation in June 2005 to collect additional groundwater and soil data from the Site to confirm the presence of DNAPL concentrations of PCE and/or TCE in the subsurface in the area of the former raw PCE aboveground storage tanks. Results of the June 2005 field investigation revealed PCE concentrations in soil cores that exceeded the maximum possible dissolved and sorbed phase PCE concentrations (based on site conditions), thereby indicating the presence of PCE DNAPL in the area of soil cores SC-1 (6-8 ft bgs), SC-3 (4-6 ft bgs), SC-7 (4-10 ft bgs and 12-16 ft bgs), and SC-8 (12-16 ft bgs) (Figure 5-1 and Table E-3).

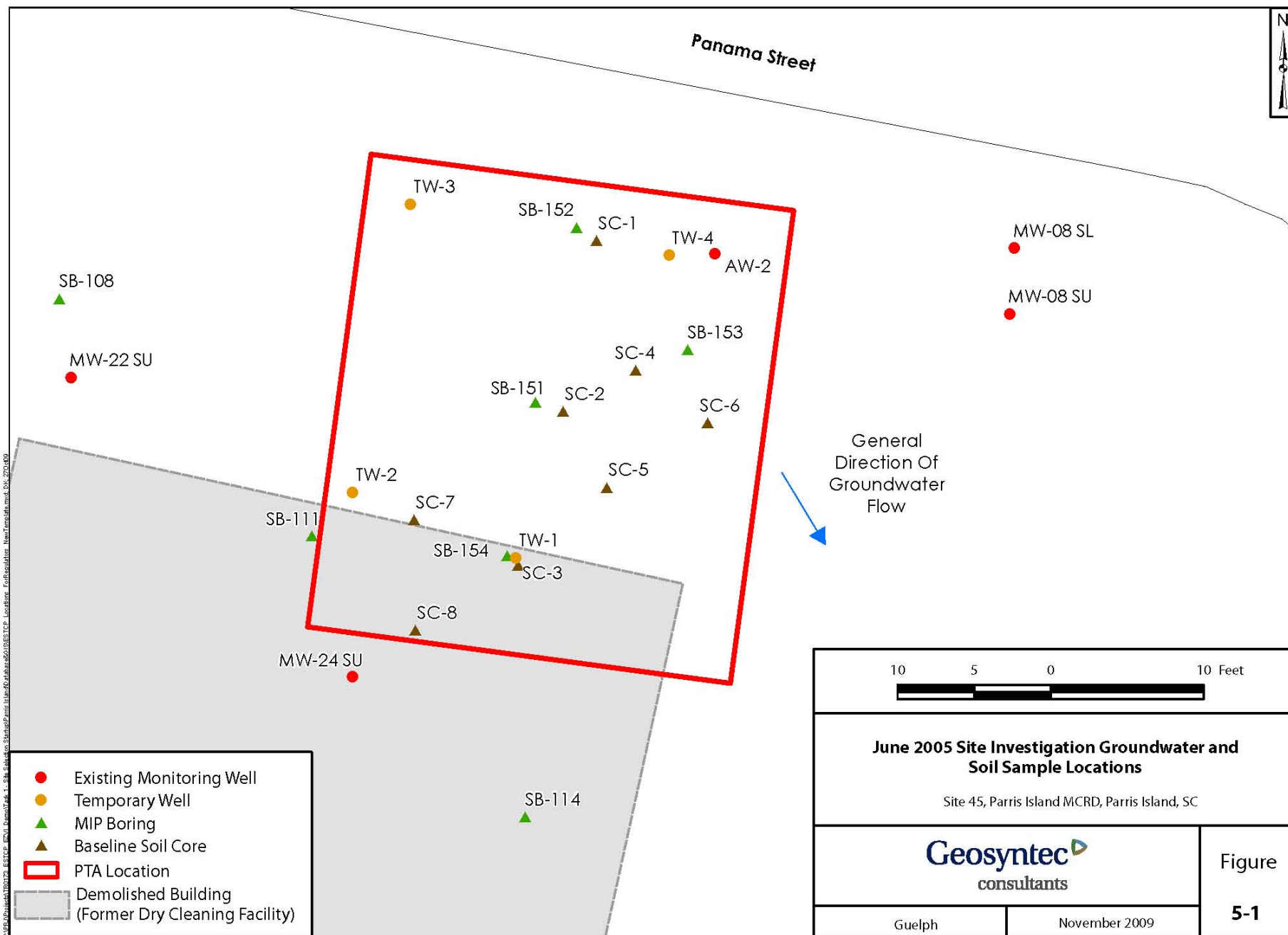
5.2 PRE-DESIGN EVALUATION AND SELECTION OF INJECTION METHODS

A review of possible methods for injecting and distributing EZVI in the subsurface at the Site was conducted to identify the optimal methods for use in the field Dem/Val. The review included an evaluation of data from a field evaluation of different injection methods for EZVI that was funded by NASA. The work for NASA involved evaluating four different injection techniques (pneumatic fracturing/injection, pressure pulse injection, hydraulic fracturing/injection and direct injection using controlled pressures, seismic enhancement and directional flow) to determine which techniques are best able to distribute the EZVI within a shallow aquifer over a large area without damage to the structure of the EZVI emulsion. Based on the results of these tests, pneumatic injection and direct injection were selected as the optimal technologies for the field Dem/Val.

Pneumatic injection will often result in pneumatic fracturing in cohesive or consolidated media. Pneumatic fracturing involves the injection of gas at high pressure and flow in order to create fractures or fissures in soil or rock matrix. Fractures or fissures occur when the pressure of injected gas exceeds the natural *in situ* stresses and the flow rate exceeds the natural permeability of the soils. In soil formations, pneumatic fracturing enhances the permeability by creating fracture networks. It was thought that the clay layers present at the Site may be cohesive enough that the pneumatic injection will create fractures in these layers. In the sandier formations, the pneumatic injection will result in a suspension of the soil particles in the nitrogen stream rather than the propagation of fractures. This suspension of soil particles in the injected nitrogen stream, referred to as fluidization, increases the size of the pore throats between particles, which can aid in the injection and distribution of the EZVI.

5.3 PRE-DESIGN LABORATORY TREATABILITY STUDY

Laboratory experiments were conducted by SiREM Laboratories (a division of Geosyntec) to evaluate the extent of DNAPL mass destruction that is due to abiotic and biological processes with the application of EZVI.

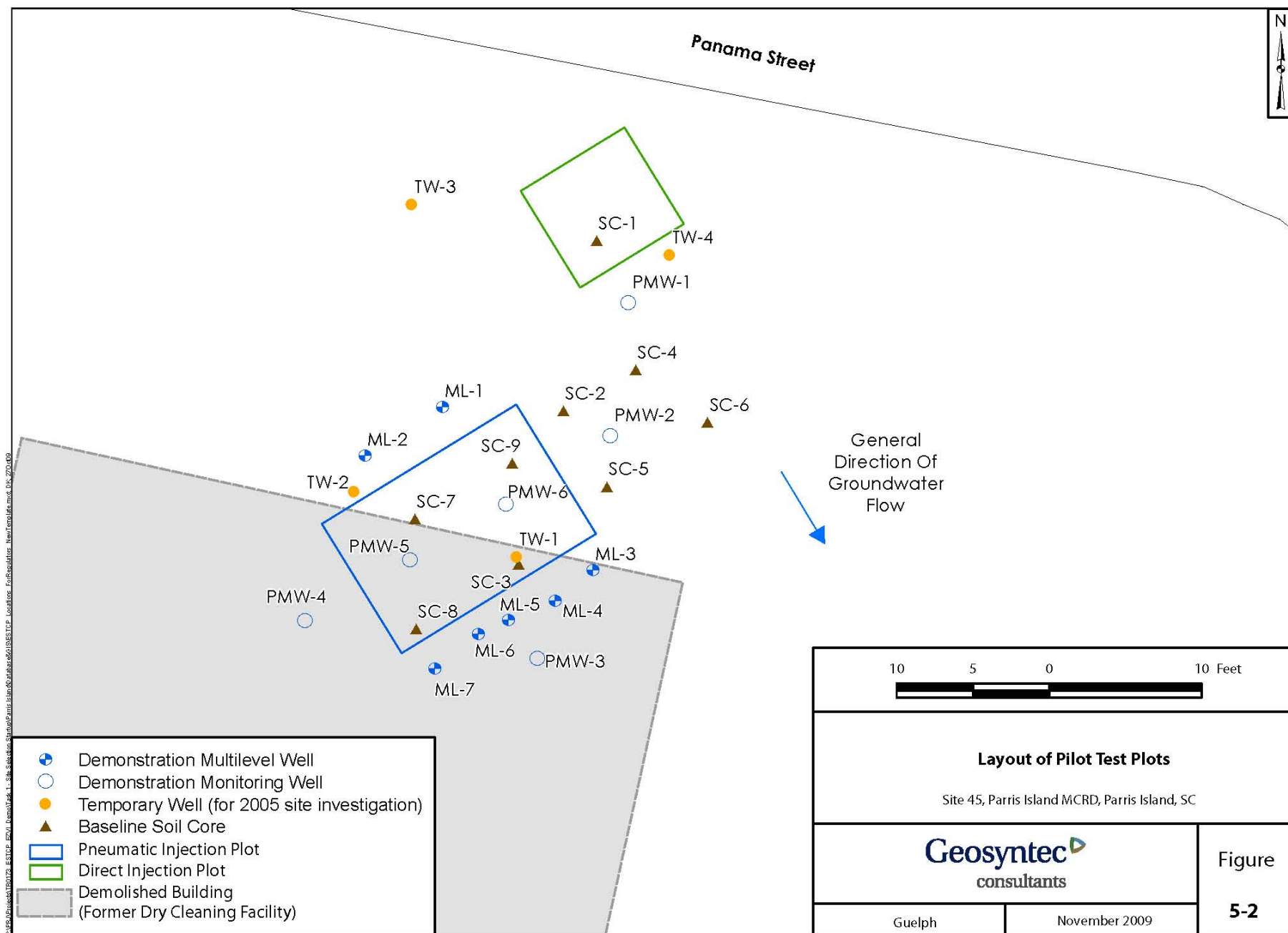


Three sets of experiments were performed as part of the pre-design laboratory study. These included: 1) nano-scale ZVI (nZVI) activity assays; 2) treatability tests conducted in bench-scale test reactors with dissolved phase TCE; and 3) treatability tests conducted in bench-scale test reactors with TCE DNAPL. Activity assays with nZVI were conducted to evaluate potential changes in the reactivity of the nZVI over time. Treatability tests were conducted to evaluate the ability of different components of the EZVI to treat dissolved and pure phase (DNAPL) TCE. Initial treatability tests were conducted using saturation concentrations of TCE (1,000 milligrams per liter [mg/L] of TCE dissolved in water) with EZVI, nZVI and the oil emulsion components without nZVI. A set of tests was also conducted using TCE DNAPL (10 times solubility of TCE in the reactor bottle, present as a separate non-aqueous phase) with EZVI, nZVI and the oil emulsion components without nZVI. All test treatments were constructed in triplicate sets of reactor bottles. Details of these experiments are presented in the Final Laboratory Treatability Report For: Emulsified Zero Valent Iron Treatment of Chlorinated Solvent DNAPL Source Areas (GeoSyntec, 2005a). The following conclusions were made based on the results of the laboratory treatability study:

1. Treatment of dissolved phase TCE with nZVI and EZVI can produce significant and rapid decreases in TCE concentrations in the aqueous phase.
2. The DNAPL treatment tests demonstrate the advantages of EZVI relative to oil emulsions or nZVI in situation where a DNAPL is present in the subsurface. The EZVI combines the sequestration of the DNAPL with the degradation of the VOCs by the nZVI resulting in an immediate reduction in the TCE flux from the source area as well as degradation due to the nZVI. The EZVI provides degradation of the TCE to ethene in a similar time frame as the nZVI and also provides sequestration of any potential untreated VOCs.
3. The EZVI provides oil that should be able to act as an electron donor to promote biodegradation of TCE which is not degraded by the nZVI, but this was not observed to a significant degree in the lab tests because of the lack of microorganisms in the test bottles.
- 4.

5.4 CONCEPTUAL EXPERIMENTAL DESIGN

For this demonstration the site was instrumented to create two hydraulically independent pilot test plots (Pneumatic Injection and Direct Injection test plots) in the existing Site DNAPL source area in June 2006 by installing a network of monitoring wells (Figure 5-2). The Pneumatic Injection test plot consists of five fully screened monitoring wells (PMW-2 through PMW-6) and seven multilevel monitoring wells (ML-1 through ML-7). The fully screened wells are screened between 4 and 19 ft bgs, while the multilevel wells each contain seven 3-inch screened intervals positioned at 2.5-ft intervals from approximately 4 to 19 ft bgs. The Direct Injection test plot consists of a single fully screened monitoring well (PMW-1) screened from 3.5 to 13.5 ft bgs.



5.5 DESIGN AND LAYOUT OF TECHNOLOGY COMPONENTS

5.5.1 Construction and Installation of Wells

All wells were installed by the USEPA (National Risk Management Research Laboratory, Ada, OK) using a hollow stem auger drill rig. The fully screened monitoring wells were constructed using 2-inch diameter Schedule 40 polyvinyl chloride (PVC) screen (#10 slot) and Schedule 40 PVC riser. A filter pack consisting of uniformly graded, rounded, clean silica sand was installed in the annulus around the well screen for all fully screened wells. The multilevel wells were constructed of 1.7-inch outside diameter (O.D.) continuous multichannel tubing (CMT; Solinst Canada Ltd., Georgetown, Ontario, Canada) with seven 0.25- to 3.25-inch screened intervals positioned at 2.5-ft intervals from 3.5 to 19 ft bgs. After placement of the CMT within the borehole, the annular space around the CMT was filled with alternating lifts of uniformly graded, rounded, clean silica sand (around the screened intervals) and coated bentonite pellets (between the screened intervals). Each well was completed at surface with a steel, flush-mount protective casing set in concrete. Well construction details are summarized in Table 5-1.

Following installation, the fully screened wells were developed by purging approximately 10 casing volumes of water from each well using a dedicated Waterra® pump system consisting of a Delrin® foot-valve attached to rigid 5/8-inch O.D. high-density polyethylene (HDPE) tubing equal in length to the depth of the well. Appendix D contains information on the Waterra® pumps.

5.6 FIELD ACTIVITIES

The field events following the well installations consisted of groundwater sampling for laboratory analysis, pump tests, and EZVI injection. A schedule of the demonstration field activities is provided in Figure 5-3. A description of the samples collected during each phase of the project, the number and type of samples collected, and the rationale for sample collection are presented in Table 5-2. The field operations are described in the sections below with the exception of field calibration procedures, quality assurance sampling, decontamination practices, and sample documentation which are described in Appendix D.

5.6.1 Baseline Sampling

In June 2006, August 2006 and October 2006, prior to EZVI injection, groundwater samples were collected from each of the fully screened and multilevel monitoring wells and analyzed for baseline chemical characterization, including:

- Field parameters (dissolved oxygen [DO], oxidation-reduction potential [ORP], pH, conductivity, temperature, turbidity, sulfide, ferrous iron);
- VOCs (including PCE, TCE, cis-1,2-DCE, trans-1,2-dichloroethene [tDCE], 1,1-dichloroethene [1,1-DCE], VC);

TABLE 5-1: SUMMARY OF WELL CONSTRUCTION DETAILS
Parris Island, South Carolina

Geosyntec Consultants

Well ID	Multilevel Channel Number	Date Installed	Northing ¹ (ft)	Easting ¹ (ft)	Ground Surface Elevation ¹ (ft amsl)	Top of Riser Pipe Elevation ¹ (ft amsl)	Surface Completion	Protective Casing Material	Riser Pipe Material	Screen Material	Screen Size	Total Depth (ft bgs)	Top of Sand Pack (ft bgs)	Top of Well Screen (ft bgs)	Bottom of Well Screen (ft bgs)	Midpoint of Well Screen (ft bgs)	Well Diameter (inches)
PMW-1	-	19-Jun-06	187398.77	2099302.37	7.09	6.88	Flush	CS	PVC	PVC	#10 slot	13.5	2.0	3.5	13.5	8.5	2.0
PMW-2	-	20-Jun-06	187390.02	2099301.14	7.14	6.99	Flush	CS	PVC	PVC	#10 slot	19.0	3.0	4.0	19.0	11.5	2.0
PMW-3	-	20-Jun-06	187375.36	2099296.32	7.14	6.98	Flush	CS	PVC	PVC	#10 slot	19.0	3.0	4.0	19.0	11.5	2.0
PMW-4	-	20-Jun-06	187377.86	2099281.11	7.08	6.83	Flush	CS	PVC	PVC	#10 slot	19.0	3.0	4.0	19.0	11.5	2.0
PMW-5	-	23-Jun-06	187381.86	2099287.95	7.17	6.87	Flush	CS	PVC	PVC	#10 slot	19.0	3.0	4.0	19.0	11.5	2.0
PMW-6	-	22-Jun-06	187385.51	2099294.28	7.08	6.89	Flush	CS	PVC	PVC	#10 slot	19.0	3.0	4.0	19.0	11.5	2.0
ML-1-1	1	25-Jun-06	187391.91	2099290.09	7.00	6.67	Flush	CS	LDPE	SS	100 mesh	5.0	3.0	a	a	4.0	0.4
ML-1-2	2											7.5	5.5	a	a	6.5	0.4
ML-1-3	3											10.0	8.0	a	a	9.0	0.4
ML-1-4	4											12.5	10.5	a	a	11.5	0.4
ML-1-5	5											15.0	13.0	a	a	14.0	0.4
ML-1-6	6											17.5	15.5	a	a	16.5	0.4
ML-1-7	7											19.5	18.0	a	a	19.0	0.375
ML-2-1	1	26-Jun-06	187388.72	2099285.01	6.92	6.69	Flush	CS	LDPE	SS	100 mesh	4.5	2.5	a	a	3.5	0.4
ML-2-2	2											7.0	5.0	a	a	6.0	0.4
ML-2-3	3											9.5	7.5	a	a	8.5	0.4
ML-2-4	4											12.0	10.0	a	a	11.0	0.4
ML-2-5	5											14.5	12.5	a	a	13.5	0.4
ML-2-6	6											17.0	15.0	a	a	16.0	0.4
ML-2-7	7											19.5	17.5	a	a	18.5	0.375
ML-3-1	1	25-Jun-06	187381.15	2099300.00	7.20	6.90	Flush	CS	LDPE	SS	100 mesh	5.0	3.0	a	a	4.0	0.4
ML-3-2	2											7.5	5.5	a	a	6.5	0.4
ML-3-3	3											10.0	8.0	a	a	9.0	0.4
ML-3-4	4											12.5	10.5	a	a	11.5	0.4
ML-3-5	5											15.0	13.0	a	a	14.0	0.4
ML-3-6	6											17.5	15.5	a	a	16.5	0.4
ML-3-7	7											19.5	18.0	a	a	19.0	0.375
ML-4-1	1	25-Jun-06	187379.13	2099297.50	7.18	6.80	Flush	CS	LDPE	SS	100 mesh	5.0	3.0	a	a	4.0	0.4
ML-4-2	2											7.5	5.5	a	a	6.5	0.4
ML-4-3	3											10.0	8.0	a	a	9.0	0.4
ML-4-4	4											12.5	10.5	a	a	11.5	0.4
ML-4-5	5											15.0	13.0	a	a	14.0	0.4
ML-4-6	6											17.5	15.5	a	a	16.5	0.4
ML-4-7	7											19.5	18.0	a	a	19.0	0.375

TABLE 5-1: SUMMARY OF WELL CONSTRUCTION DETAILS
Parris Island, South Carolina

Geosyntec Consultants

Well ID	Multilevel Channel Number	Date Installed	Northing ¹ (ft)	Easting ¹ (ft)	Ground Surface Elevation ¹ (ft amsl)	Top of Riser Pipe Elevation ¹ (ft amsl)	Surface Completion	Protective Casing Material	Riser Pipe Material	Screen Material	Screen Size	Total Depth (ft bgs)	Top of Sand Pack (ft bgs)	Top of Well Screen (ft bgs)	Bottom of Well Screen (ft bgs)	Midpoint of Well Screen (ft bgs)	Well Diameter (inches)
ML-5-1	1	26-Jun-06	187377.87	2099294.45	7.11	6.78	Flush	CS	LDPE	SS	100 mesh	5.0	3.0	a	a	4.0	0.4
ML-5-2	2											7.5	5.5	a	a	6.5	0.4
ML-5-3	3											10.0	8.0	a	a	9.0	0.4
ML-5-4	4											12.5	10.5	a	a	11.5	0.4
ML-5-5	5											15.0	13.0	a	a	14.0	0.4
ML-5-6	6											17.5	15.5	a	a	16.5	0.4
ML-5-7	7											19.5	18.0	a	a	19.0	0.375
ML-6-1	1	26-Jun-06	187376.95	2099292.48	7.07	6.67	Flush	CS	LDPE	SS	100 mesh	5.0	3.0	a	a	4.0	0.4
ML-6-2	2											7.5	5.5	a	a	6.5	0.4
ML-6-3	3											10.0	8.0	a	a	9.0	0.4
ML-6-4	4											12.5	10.5	a	a	11.5	0.4
ML-6-5	5											15.0	13.0	a	a	14.0	0.4
ML-6-6	6											17.5	15.5	a	a	16.5	0.4
ML-6-7	7											19.5	18.0	a	a	19.0	0.375
ML-7-1	1	26-Jun-06	187374.69	2099289.62	7.12	6.76	Flush	CS	LDPE	SS	100 mesh	4.5	2.5	a	a	3.5	0.4
ML-7-2	2											7.0	5.0	a	a	6.0	0.4
ML-7-3	3											9.5	7.5	a	a	8.5	0.4
ML-7-4	4											12.0	10.0	a	a	11.0	0.4
ML-7-5	5											14.5	12.5	a	a	13.5	0.4
ML-7-6	6											17.0	15.0	a	a	16.0	0.4
ML-7-7	7											19.5	17.5	a	a	18.5	0.375

Notes:

ft - feet

ft amsl - feet above mean sea level

ft bgs - feet below ground surface

CS - cast steel

PVC - polyvinyl chloride

LDPE - low-density polyethylene

SS - stainless steel

¹ - Surveying by Palmetto Land Surveying, Inc. Horizontal datum referenced to NAD 83. Vertical datum referenced to NAVD 88. After the survey was completed, top of casing elevations were altered by the addition of pressure fittings and have not yet been resurveyed. As such, top of casing elevations are not included in the table.

a Channels 1 to 6 have a screen length of 3.25-inches. Channel 7 has a screen length of 0.25-inches.

TABLE 5-2: TOTAL NUMBER AND TYPES OF SAMPLES COLLECTED
Parris Island, South Carolina

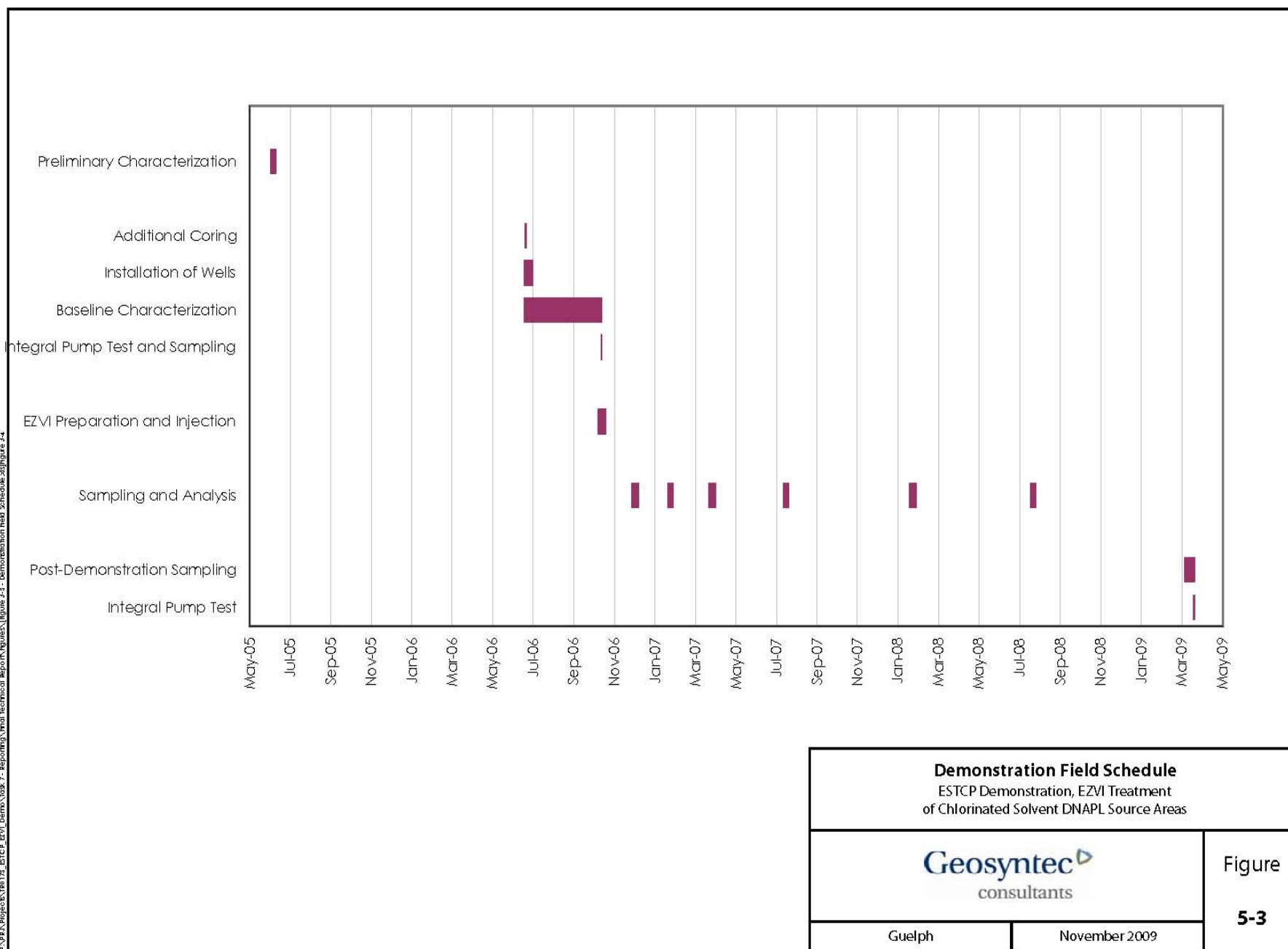
Geosyntec Consultants

Component	Matrix	Analyte	Specific Parameter of Interest	Frequency	Number of Samples ¹	Location	Rationale/Use
Pre-demonstration sampling	Groundwater	VOCs	PCE, TCE, cDCE, tDCE, 1,1-DCE, VC	Once	15	TW-1 through TW-4, AW-2, MW-08SU, MW-22SU	Identify source zone
	Soil	VOCs	PCE, TCE, cDCE, tDCE, 1,1-DCE, VC	Once	62	SC-1 through SC-8	Identify source zone
Integral Pump Tests	Groundwater	VOCs	PCE, TCE, cDCE, tDCE, 1,1-DCE, VC	Pre-EZVI injection and post-demonstration	16	PMW-3	Estimate the change in contaminant mass flux from the Pneumatic Injection test plot over the treatment duration
		DHGs	methane, ethane, ethene, acetylene	Pre-EZVI injection and post-demonstration	16	PMW-3	Estimate the change in contaminant mass flux from the Pneumatic Injection test plot over the treatment duration
Demonstration Sampling	Groundwater	Field Parameters	DO, ORP, pH, temperature, conductivity, turbidity, sulfide, ferrous iron	Baseline, 6 post-injection events, post-demonstration	357	Select fully screened and multilevel wells	Primarily to monitor significant shifts in redox conditions
		VOCs	PCE, TCE, cDCE, tDCE, 1,1-DCE, VC	Baseline, 6 post-injection events, post-demonstration	317	Select fully screened and multilevel wells	Assess the extent of VOC degradation in both injection plots and mass flux reduction in the Pneumatic Injection plot
		DHGs	methane, ethane, ethene, acetylene	Baseline, 6 post-injection events, post-demonstration	308	Select fully screened and multilevel wells	Assess the extent of VOC degradation and methanogenesis in both injection plots
		VFAs	acetic acid, butyric acid, lactic acid, propionic acid, pyruvic acid	Baseline, 4 post-injection events, post-demonstration	116	Select fully screened and multilevel wells	Evaluate electron donor concentrations, monitor degradation of vegetable oil, and quantify the presence of organic matter in groundwater
		Alkalinity	CaCO ₃	Baseline, 6 post-injection events, post-demonstration	318	Select fully screened and multilevel wells	Monitor major shifts in buffering
		TOC	TOC	Baseline, 6 post-injection events, post-demonstration	332	Select fully screened and multilevel wells	Evaluate electron donor concentrations, monitor degradation of vegetable oil, and quantify the presence of organic matter in groundwater
		Cations/Dissolved Metals	Fe ²⁺ , Mn ²⁺ , EPA list	Baseline, 6 post-injection events, post-demonstration	332	Select fully screened and multilevel wells	Monitor the occurrence of Fe and Mn reduction
	Soil	VOCs	PCE, TCE, cDCE, tDCE, 1,1-DCE, VC	Baseline, post-demonstration	40	SC-9 through SC-13	Determine estimate of DNAPL mass
		EZVI	NA	Post-EZVI injection, post-demonstration	16	ESC-01 through ESC-16	Evaluate EZVI distribution and confirm emulsion droplet integrity
		f _{oc}	NA	Baseline	3	SC-9	Confirm assumed values used to estimate PCE DNAPL mass
		Porosity	NA	Baseline	3	SC-9	Confirm assumed values used to estimate PCE DNAPL mass

Notes:

NA - not applicable

¹ - numbers do not include QA/QC samples



- Dissolved hydrocarbon gases (DHGs) (including methane, ethane, ethene);
- Anions (chloride, nitrate, nitrite, sulfate);
- Volatile fatty acids (VFAs); and
- General geochemical indicators (alkalinity, total organic carbon [TOC], cations, dissolved metals).

All groundwater samples were collected using peristaltic pumps (either a Geopump [Geotech Environmental Equipment, Inc.; Denver, CO] or ISMATEC REGLO [ISMATEC SA; Switzerland]) with dedicated well tubing. Eight soil cores (SC-1 through SC-8) were collected at the Site during the June 2005 Site investigation to evaluate whether there was sufficient VOC mass at the Site to conduct the EZVI field Dem/Val (Figure 5-1). An additional soil core (SC-9; Figure 5-2) was collected from within the Pneumatic Injection test plot in June 2006 to complete the baseline mass evaluation. Soil cores were sampled in 2-foot long sections and VOCs were extracted from each two foot section with methanol on-site. The methanol extraction procedure is described in detail in Appendix D. Measurements of soil porosity, bulk density, and fraction of organic carbon were performed on select soil samples from SC-9 to further refine VOC mass estimates. Results are presented in Appendix E (Table E-2).

Borehole logs for soil cores SC-1 through SC-9 can be found in Appendix B. Soil lithology beneath each test plot is described below.

- The Pneumatic Injection Test Plot consists primarily of grayish/brown, fine to medium grained silty sand with intermittent clay lenses to a depth of approximately 18 ft bgs. A predominant clay lense was encountered between 8 and 10 ft bgs, and peat was typically encountered at a depth of approximately 18 ft bgs. Orange/brown molting was observed on silty sands between 4 and 8 ft bgs.
- The Direct Injection Test Plot consists primarily of light to dark grey, fine grained sand with traces of silt and clay to depth of approximately 17 ft bgs. A clay lense was encountered from approximately 17 to 18 ft bgs, and peat was encountered at approximately 18 ft bgs.

All samples were collected by Geosyntec and USEPA personnel using sampling protocols outlined in the Sampling and Analysis Plan (SAP) developed for the field Dem/Val (Appendix B of the Demonstration Plan [Geosyntec, 2006b]). Procedures used to ensure data quality are summarized in the Quality Assurance Project Plan (QAPP; Appendix C of the Demonstration Plan [Geosyntec, 2006b]).

In the Pneumatic Injection test plot, VOC results from soil cores SC-9, SC-3, SC-8 and SC-7 were used to calculate estimates of VOC mass (as either sorbed or DNAPL) in soils in the northern, eastern, southern and western quadrants of the test plot, respectively. Groundwater

VOC results from wells PMW-5 and PMW-6 were used to calculate estimates of dissolved phase VOC mass in the northeastern and southwestern halves of the test plot, respectively. Test plot dimensions of 15 ft wide, 10 ft long, and 12 ft in vertical thickness (6 to 18 ft bgs) were used for the calculations. PCE DNAPL mass was estimated from threshold PCE soil concentrations using the equation below to determine the presence of DNAPL:

$$C_t = \frac{C_{\text{water}} (K_d \rho_b + n)}{\rho_b} \quad (1)$$

Where:

C_t = maximum PCE concentration in the dissolved and adsorbed phases (mg/Kg)

C_{water} = PCE Solubility; 240 mg/L at 20°C

ρ_b = bulk density of soil (g/cm³): clay/silty clay=0.98; sand=1.55; peat=0.3 (from SC-9)

n = porosity (unitless): clay/silty clay=0.625; sand=0.281; peat=0.844 (from SC-9)

K_d = partitioning coefficient of PCE in soil [(mg/Kg)/(mg/L)] = $K_{oc}f_{oc}$

K_{oc} = organic carbon partition coefficient for PCE [(mg/Kg)/(mg/L)]: clay/silty clay=447; sand=355; peat=631 (Montgomery, 2000)

f_{oc} = fraction organic carbon (unitless): clay/silty clay=0.045; sand=0.00088; peat=0.25 (from SC-9)

VOC results from soil core SC-1 were used to calculate estimates of VOC mass (as either sorbed or DNAPL) in soils in the Direct Injection test plot. Three separate treatment zones (corresponding to the three injection points), with each zone measuring 2 ft in diameter and 6 ft in vertical thickness (6 to 12 ft bgs) were assumed for the calculations. PCE DNAPL mass was estimated as above for the Pneumatic Injection test plot.

5.6.2 Pre-Injection Integral Pump Test

Integral pump tests (IPTs) were performed downgradient of the Pneumatic Injection test plot at monitoring well PMW-3 prior to EZVI injection in October 2006 and at the end of the performance monitoring period in March 2009 to aid in evaluating the performance of the EZVI. Results of the integral pump tests were used to estimate the change in contaminant mass flux from the Pneumatic Injection test plot over the test period. Results were also compared to mass flux estimates calculated using data collected from the multilevel transects located downgradient of the Pneumatic Injection test plot.

The integral pump test is based on the quantification of contaminant mass flux across a control plane located downgradient of a source zone and perpendicular to the direction of

groundwater flow. In comparison with point scale measurements using a transect of monitoring wells, the integral pump test uses a large sampling volume obtained by pumping water from one or more wells situated along the control plane. If the entire groundwater discharge downgradient from the source is captured, then the total mass discharge from the source zone can be determined (Bockelmann, 2002).

During groundwater extraction from the well(s), samples are collected and contaminant concentrations are determined as a function of time. A simplified analytical solution can then be used to quantify the mass discharge at the control plane established by the pumping well(s) (Bockelmann, 2002). This approach consists of calculating contaminant concentrations in distinct aquifer regions, called streamtubes, which span the length of the control plane and that are established by the incremental increases in the well capture zone between successive sample times. The total mass flux (MF) across the control plane is then calculated by combining the individual MFs for each streamtube as follows:

$$MF = 2 \sum_{i=1}^N Q_i C_{xi} \quad (2)$$

Where N is the number of data points (sample times), Q_i is the flow rate within the streamtube corresponding to sample time t_i , and C_{xi} is a function of the concentration measured at the pumping well for sample time t_i (Bockelmann, 2002), and is calculated using a recursive formula presented by Schwarz (2001).

Prior to conducting the pre-injection IPT, a numerical groundwater flow model was developed to estimate the approximate limits of groundwater capture at the end of the IPT and to estimate the extent to which water that originates in the screens of each of the fully screened monitoring wells and multi-level wells will travel during the IPT. Results of the model indicate that the capture zone for the IPT is mainly centered on the area directly downgradient of the Pneumatic Injection test plot as designed to evaluate the changes in mass flux out of the treatment area. Complete details of the IPT modeling effort is presented in the September 18, 2006 Integral Pump Test Modeling memorandum (Appendix E).

During the pre-injection IPT, groundwater was extracted from well PMW-3, located immediately downgradient of the Pneumatic Injection test plot, at a rate of approximately 1.25 gallon per minute (gpm) for 16 hours using a submersible pump. Samples of the extracted groundwater were collected from the pump discharge at pre-determined times for analysis of VOCs and DHGs. A summary of the VOC concentrations during the IPT is presented in Table 5-3. The extracted water was stored in an on-site storage tank for subsequent treatment and disposal.

The total mass flux across the Pneumatic Injection test plot was calculated by inserting the measured VOC and DHG (ethene only) concentrations into Equation 2 above. This calculation was also performed for the post-demonstration IPT (see Section 5.6.6) in order to assess the

**TABLE 5-3: SUMMARY OF PRE-EZVI INJECTION IPT VOC CONCENTRATIONS
Parris Island, South Carolina**

Geosyntec Consultants

Sample ID: Sample Date: Time sampled (hr):	PMW3-15M 12-Oct-06 0.25	PMW3-30M 12-Oct-06 0.5	PMW3-1H 12-Oct-06 1	PMW3-2H 12-Oct-06 2	PMW3-4H 12-Oct-06 4	PMW3-8H 12-Oct-06 8	PMW3-12H 13-Oct-06 12	PMW3-16H 13-Oct-06 16
<u>VOCs (µg/L)</u>								
1,1-Dichloroethene	250 U	200 U	200 U	200 U	100 U	500 U	--	100 U
cis-1,2-Dichloroethene	28,000	19,000	17,000	15,000	14,000	13,000	10,000	10,000
Tetrachloroethene	26,000	19,000	20,000	20,000	19,000	20,000	19,000	19,000
trans-1,2-Dichloroethene	1,000	640	570	410	470	500 U	380	310
Trichloroethene	12,000	8,900	9,200	8,900	8,800	8,500	7,900	7,400
Vinyl Chloride	2,000	1,300	1,200	1,200	1,000	1,100	870	850
<u>Dissolved Hydrocarbon Gases (µg/L)</u>								
Acetylene	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Ethane	1.0 U	0.55 J	0.53 J	0.39 J	0.38 J	1.0 U	1.0 U	1.0 U
Ethene	78	79	78	79	67	79	78	84
Methane	280	320	310	310	270	300	280	290

Notes:

U - parameter was not detected; associated value is quantitation limit

J - indicates that the parameter was detected above the method detection limit but below the quantitation limit and the associated numeric result is estimated

µg/L - micrograms per liter

change in contaminant mass flux from the Pneumatic Injection test plot over the test period. A depth to water of 3.4 ft bgs was assumed for the calculations as this was the measured depth to water in well PMW-3 prior to conducting the pre-injection IPT. A total depth of 20 ft bgs was also used for the calculations as this was assumed to be the total depth of the upper aquifer. Mass flux estimates are summarized in Section 5.8.4, and mass flux calculation data is presented in Appendix E (Tables E-46 and E-47).

5.6.3 Injection Permitting

Approval was obtained from the South Carolina Department of Health and Environmental Control (SCDHEC) for the injection of EZVI at the Site.

5.6.4 EZVI Manufacturing

The EZVI used in the Dem/Val was the same formulation that was used in the laboratory treatability tests, and was composed of nZVI from Toda (RNIP-10DS), water, corn oil and surfactant (Span 85) in the following proportions by weight: 10%, 51%, 38% and 1%, respectively. The EZVI was manufactured on site in the same 55 gallon drums that the nZVI was shipped in from Japan. Each drum was shipped with the correct amount of iron in it to make up a ~46 gal batch of EZVI.

The EZVI manufacturing process is depicted in Figure 5-4. A winch system was set up on Site to lift the double-bagged EZVI, which was shipped under a nitrogen head in a deoxygenated water slurry, up slightly in the drum to allow access to cut the plastic bags containing the iron and drain the iron slurry into the drum. Attempts were made to keep a nitrogen head on the drum while working. The drum was placed on a scale used to estimate the weight of the water present in the drum (shipped from Japan with an estimated 22 gal of deoxygenated water). Once the plastic bags had been removed, additional water (approximately 2 gals of potable water from a tap at the site) was added to the drum to obtain the correct amount by weight for a drum's worth of EZVI. The drum containing water and nZVI was then placed under an industrial mayonnaise mixer used to stir the contents of the drum. The surfactant (0.5 gal per drum) was measured and mixed into the vegetable oil (~20 gal per drum) prior to adding the vegetable oil to the nZVI drum. The mixer was turned on and the water and nZVI were mixed to get the nZVI into suspension. Oil (containing the surfactant) was then slowly added to the iron slurry until the correct amount had been added (38% by weight) and the nZVI slurry and oil formed an emulsion in the drum. The mixer was then removed from the drum, a nitrogen head added to the top of the drum and the drum sealed and moved to the staging area for the injections. A sample of EZVI that was made on site was collected and an activity assay was performed to insure that the nZVI was still reactive after exposure to oxygen during mixing and from the oxygen in the top-up water that was added to the nZVI slurry. The activity assay results compared well with those conducted in the laboratory in zero-oxygen atmosphere indicating that there was no significant loss of nZVI reactivity during the manufacturing of the EZVI.



EZVI Manufacturing Site 45, Parris Island MCRD, Parris Island, SC	
Guelph	October 2009
Figure 5-4	

Once all EZVI had been made and the drums moved to the staging area, the EZVI was transferred from the drums to holding tanks on the injection rigs using industrial pumps.

5.6.5 EZVI Injection

EZVI was injected into the test plots in October 2006. The technology demonstration was designed to inject a maximum of 850 gal of EZVI into the Pneumatic Injection test plot and 50 gal into the Direct Injection test plot (see Section 3.6.5 of the Demonstration Plan, Geosyntec 2006b). However, due to daylighting of EZVI (EZVI migrating up former investigation borings to ground surface) in the Pneumatic Injection test plot it is estimated that 576 gal of EZVI was injected into 8 locations within the Pneumatic Injection test plot between 7 and 18.5 ft bgs (2 injection locations were performed using Direct Injection technology), and an estimated 32 gal of EZVI came to surface. A total of 151 gal of EZVI was injected into 4 locations within the Direct Injection test plot between 6 and 12 ft bgs and an estimated 5 gal of EZVI came to surface. Table 5-4 provides a summary of the volume of EZVI injected into each test plot, and Figure 5-5 depicts the injection locations.

Pneumatic Injection Test Plot

Pneumatic injections were performed by Pneumatic Fracturing, Inc. (Alpha, NJ). The injection nozzle consisted of a bullet-shaped nozzle which is threaded on both the inside and outside. The inside drill casing is 1.5 inches in diameter and the outside drill casing is 3 inches in diameter. The inside casing functions as the pathway for the nitrogen and the injectate media and the outside casing supports the nozzle during installation. For the pneumatic injections, a two-step injection procedure was used. First, the formation was fluidized by the injection of nitrogen alone, followed by injection of the EZVI with nitrogen as the carrier. The injection nozzle is designed to inject media in a horizontal or planar format in a 360° circumference. The nozzle itself is directional, so that each injection covers an area of 90°. To achieve a 360° circumference, the nozzle was rotated between injections four times at each depth interval. The nozzle is designed to produce a high fluid velocity so that the maximum acceleration of gases and media is achieved immediately before entry into the soil formation. After the injection was completed, the nozzle was retracted upward approximately 2 feet and the process repeated. Nitrogen initiation and maintenance pressures and pump pressures were monitored and logged during all injection events. All measurements were collected utilizing a pressure transducer and a pressure gauge located at the nitrogen trailer and a pressure gauge at the pump head. A summary of these measurements is presented in Appendix F.

Efforts were made to control the placement of the EZVI in the test plot. A set of five injection points were planned for the Pneumatic Injection test plot, with injections occurring from 7 to 18.5 ft bgs. Efforts were made to inject more EZVI in the southwestern half of the plot between ML-2 and ML-5, ML-6 and ML-7 to match the distribution of DNAPL in the test plot. The injection strategy was to inject in the outer or corner injection points (each a 90° injection), pushing the EZVI and potentially mobile DNAPL toward the center of the plot, followed by injection of EZVI in the middle of the plot (a total of 360° injection, comprised of four 90°

TABLE 5-4: EZVI INJECTION VOLUMES
Parris Island, South Carolina

Geosyntec Consultants

Injection Point	Injection Date & Start Time	Injection Depth (ft bgs)	Injection Direction	Volume of EZVI Injected (gal)	EZVI Daylighting Observed	Volume of EZVI Daylighted ¹ (gal)	Notes
Pneumatic Injection Plot							
IP1	14-Oct-06 11:17	17.5	E	16.0	No	-	
		15.5	E	16.0	No	-	
		13.5	E	20.0	No	-	
		11.5	E	16.0	Yes	<0.25	<0.25 gal daylighted in area between IP1 and PMW-4
IP3	14-Oct-06 15:25	17.0	W	16.0	No	-	
		15.0	W	16.0	Yes	<0.25	<0.25 gal daylighted around ML-3 pad
		13.0	W	16.0	Yes	<0.25	<0.25 gal daylighted around ML-3 pad
		11.0	W	16.0	Yes	<0.25	<0.25 gal daylighted around ML-3 pad
		9.0	W	16.0	Yes	<0.25	<0.25 gal daylighted around ML-3 pad
IP4	16-Oct-06 10:14	7.0	W	16.0	Yes	<0.25	<0.25 gal daylighted around ML-3 pad
		17.5	S	10.0	No	-	
		15.5	S	10.0	No	-	
		13.5	S	10.0	No	-	
		11.5	S	10.0	No	-	
IP2	16-Oct-06 14:03	9.5	S	10.0	No	-	
		7.5	S	10.0	No	-	
		17.5	N	16.0	No	-	
		15.5	N	16.0	No	-	
		13.0	N	16.0	No	-	
IP5	17-Oct-06 9:40	11.0	N	16.0	No	-	
		9.0	N	16.0	No	-	
		7.0	N	16.0	No	-	
		18.5	NW	16.0	No	-	Water coming from PMW-6 and PMW-3 discharge lines
		18.5	NE	16.0	No	-	Small dark slugs in PMW-6 discharge line
		18.5	SE	16.0	No	-	Small dark slugs in PMW-6 discharge line
IP10	17-Oct-06 15:42	18.5	SW	16.0	No	-	Small dark slugs in PMW-6 discharge line, puff of dust between IP5 and ML-3 during shut
		16.5	SW	16.0	No	-	
		16.5	NW	16.0	Yes	1.0	4 gal daylighted around PMW-6 pad and from location between IP5 and ML-3, assume 50% EZVI 50% water
		14.0	NW	9.0	Yes	2.5	5 gal daylighted around PMW-6 pad, assume 50% EZVI 50% water
		18.0	NE	27.0	Yes	1.5	3 gal daylighted around PMW-6 pad, assume 50% EZVI 50% water
IP11	17-Oct-06 18:22	16.0	NE	27.0	Yes	3.0	6 gal daylighted around PMW-6 pad, assume 50% EZVI 50% water
		15.0	NE	27.0	Yes	7.5	15 gal daylighted around PMW-6 pad, assume 50% EZVI 50% water
		14.0-13.0	360°	20.0	Yes	2.0	4 gal daylighted around PMW-6 pad, assume 50% EZVI 50% water
IP12	18-Oct-06 9:40	13.0-12.0	360°	10.0	Yes	2.5	5 gal daylighted around PMW-6 pad, assume 50% EZVI 50% water
		11.0-10.0	360°	5.0	Yes	2.5	5 gal daylighted around PMW-6 pad, assume 50% EZVI 50% water
		16.5-15.5	360°	25.0	Yes	2.5	5 gal daylighted around PMW-6 pad, assume 50% EZVI 50% water
Total				576.0			10 gal daylighted around PMW-6 pad, assume 50% EZVI 50% water
Direct Injection Plot							
IP6	15-Oct-06 11:33	12-11	360°	16.0	No	-	
		11-10	360°	14.0	No	-	
		10-9	360°	14.0	Yes	<0.25	<0.5 gal daylighted in SC-1/SB152 area, assume 50% EZVI
		9-8	360°	14.0	Yes	<0.25	<0.5 gal daylighted in SC-1/SB152 area, assume 50% EZVI
		8-7	360°	10.0	Yes	<0.25	<0.5 gal daylighted in SC-1/SB152 area, assume 50% EZVI
IP9	15-Oct-06 14:46	6-7	360°	3.0	Yes	<0.25	<0.25 gal daylighted in SC-1/SB152 area
		7-8	360°	6.0	Yes	<0.25	<0.25 gal daylighted in SC-1/SB152 area
		8-9	360°	9.0	Yes	<0.25	<0.25 gal daylighted in SC-1/SB152 area
		9-10	360°	6.0	Yes	<0.25	<0.25 gal daylighted in SC-1/SB152 area
		10-11	360°	5.0	Yes	0.5	1 gal daylighted in SC-1/SB152 area, assume 50% EZVI
IP7	15-Oct-06 16:22	11-12	360°	6.0	Yes	0.5	1 gal daylighted in SC-1/SB152 area, assume 50% EZVI
		6-7	360°	2.5	Yes	<0.25	<0.25 gal daylighted in SC-1/SB152 area
		8-9	360°	4.5	Yes	<0.25	<0.25 gal daylighted in SC-1/SB152 area
		9-10	360°	3.1	Yes	0.75	1.5 gal daylighted in SC-1/SB152 area, assume 50% EZVI
IP8	15-Oct-06 17:40	11-12	360°	2.1	Yes	0.5	1 gal daylighted in SC-1/SB152 area, assume 50% EZVI
		12-11	360°	6.0	No	-	
		11-10	360°	6.0	No	-	
		10-9	360°	6.0	No	-	
		9-8	360°	6.0	No	-	
Total				151.2			<0.25 daylighted from top of IP8 hole

Notes:

ft bgs - feet below ground surface

gal - gallons

¹ - Value is an estimated volume of EZVI that daylighted assuming daylighted material consists of 50% EZVI and 50% groundwater

TABLE 5-5: SUMMARY OF EZVI SOIL CORE OBSERVATIONS
Parris Island, South Carolina

Geosyntec Consultants

Injection Plot	Coring Event	Core ID	Date Cored	Depth Interval (ft bgs)	Distance to Nearest EZVI Injection Point (ft)	EZVI Observed	Observations
Pneumatic Injection	Post-Injection	ESC-1	14-Oct-06	4-8 8-12 12-16 16-18	1.6 (IP-3)	Yes Yes No No	EZVI at ~6.75ft and ~7.5ft EZVI at ~11.4-11.6ft and ~11.75-12ft No EZVI observed (dark sands) No EZVI observed (dark sands and peat)
		ESC-2	14-Oct-06	4-8 8-12 12-16 16-18	5.3 (IP-3)	Yes No No No	EZVI lenses at ~7ft and ~7.6ft Dark grey clay 8-9.5ft, dark sand 11-12ft dark sands No EZVI observed
		ESC-3	18-Oct-06	4-8 8-12 12-16 16-19	3.3 (IP-12)	Possible Possible Yes No	Possible EZVI at 6, 7 and 7.5ft (dark sands) Possible EZVI at 10ft (dark sands) EZVI at ~15ft (by organic/wood piece) No EZVI observed (difficult to see b/c of dark clay and peat)
		ESC-4	18-Oct-06	4-8 8-12 12-16 16-19	3.4 (IP-5)	No Yes Yes Yes	No EZVI observed EZVI at 10ft a lot of EZVI from ~15.5-16ft (EZVI saturated sand) EZVI at 18ft (right above peat layer)
		ESC-5	18-Oct-06	4-8 8-12 12-16 16-19	3.4 (IP-3)	Yes Yes No Yes	EZVI from 6.5-7ft (saturated sand) small amount of EZVI at top of core (~8ft) No EZVI observed small amount of EZVI at ~18ft
		ESC-6	18-Oct-06	4-8 8-12 12-16 16-19	4.8 (IP-5)	Possible No No Possible	Possible EZVI at 5.5ft and 6.8ft No EZVI observed No EZVI observed (only 1ft recovery) Possible EZVI at 18.3ft (seen on peat, shiny peat)
	Post- Demonstration	ESC-11	19-Mar-09	4-8 8-12 12-16 16-20	4.4 (IP-5)	Yes Yes/Possible Possible No	EZVI from 5'5"-5'7" EZVI 8'5", possible EZVI at 10'4" Possible EZVI at 13'5" No EZVI observed
		ESC-12	19-Mar-09	4-8 8-12 12-16 16-20	2.6 (IP-11)	Possible Yes Yes Possible	Possible EZVI from 5'3"-5'5" EZVI finger at 8'9" Small amount of EZVI from 13'3"-13'5" (partially saturated soil), multiple EZVI stringers from 15'1"-15'9" (possible bentonite with EZVI absorbed onto - turned bentonite pale green color) Possible EZVI from 18'4"-18'5"
		ESC-13	18-Mar-09	4-8 8-12 12-16 16-20	3.4 (IP-12)	Possible/Yes No No Possible/Yes	Possible EZVI from 5'4"-5'5" and at 6', EZVI stringers from 7'-7'7" No EZVI observed No EZVI observed Possible EZVI at 18'10", EZVI at 19'5"
		ESC-14	18-Mar-09	4-8 8-12 12-16 16-20	2.9 (IP-3)	Possible No Possible No	Possible EZVI from 5'3"-5'5", 6'5"-6'6", and 7'5" No EZVI observed Possible EZVI at 13'4" No EZVI observed
		ESC-16	19-Mar-09	4-8 8-12 12-16 16-20	5.9 (IP-3)	Yes No No Possible	Multiple stringers of EZVI from 5'2"-6', EZVI from 6'6"-6'7" No EZVI observed No EZVI observed Possible EZVI at 19'3"
		ESC-17	19-Mar-09	4-8 8-12 12-16 16-20	7.0 (IP-2)	Possible/Yes No No No	Possible EZVI at 4'11", EZVI stringer at 7'8" No EZVI observed No EZVI observed No EZVI observed

TABLE 5-5: SUMMARY OF EZVI SOIL CORE OBSERVATIONS
Parris Island, South Carolina

Geosyntec Consultants

Injection Plot	Coring Event	Core ID	Date Cored	Depth Interval (ft bgs)	Distance to Nearest EZVI Injection Point (ft)	EZVI Observed	Observations
Direct Injection	Post-Injection	ESC-7	18-Oct-06	4-8 8-12	2.8 (IP-3)	Possible Yes	Possible EZVI from 5-6ft, spotty (dark grey spots in lighter gray sand) from 6-7ft, possible EZVI at 7' 10" EZVI at 9' 10", void with EZVI at 10'
		ESC-8	18-Oct-06	4-8 8-12	2.3 (IP-6)	Possible Yes	Possible scattered EZVI from 5.5-7ft (or black sands?) good amount of EZVI from 11-12ft (mainly from 11-11.5ft)
		ESC-9	18-Oct-06	4-8 8-12	1.4 (IP-8)	Possible Yes	Possible scattered EZVI from 6.5-8ft (dark sands) EZVI at 10.5ft (~2 inches)
		ESC-10	18-Oct-06	4-8 8-12	2.2 (IP-8)	Possible Yes	Possible scattered EZVI from 6.5-7.5ft (dark sand spots?) EZVI at 9' 10" and 10' 10", possible EZVI at 9' (but might be dark clay)
	Post-Demonstration	ESC-15	19-Mar-09	4-8	1.7 (IP-9)	Possible/Yes	Possible EZVI from 5'-6' (speckled black spots), EZVI at 7'6"
				8-12		Possible/Yes	Possible EZVI from 8'6"-8'9" (marble effect dark staining on clay), EZVI at 9'5"
				12-16		Possible	Possible small amount of EZVI at 13'
				16-20		No	No EZVI observed

Notes:

ft - feet

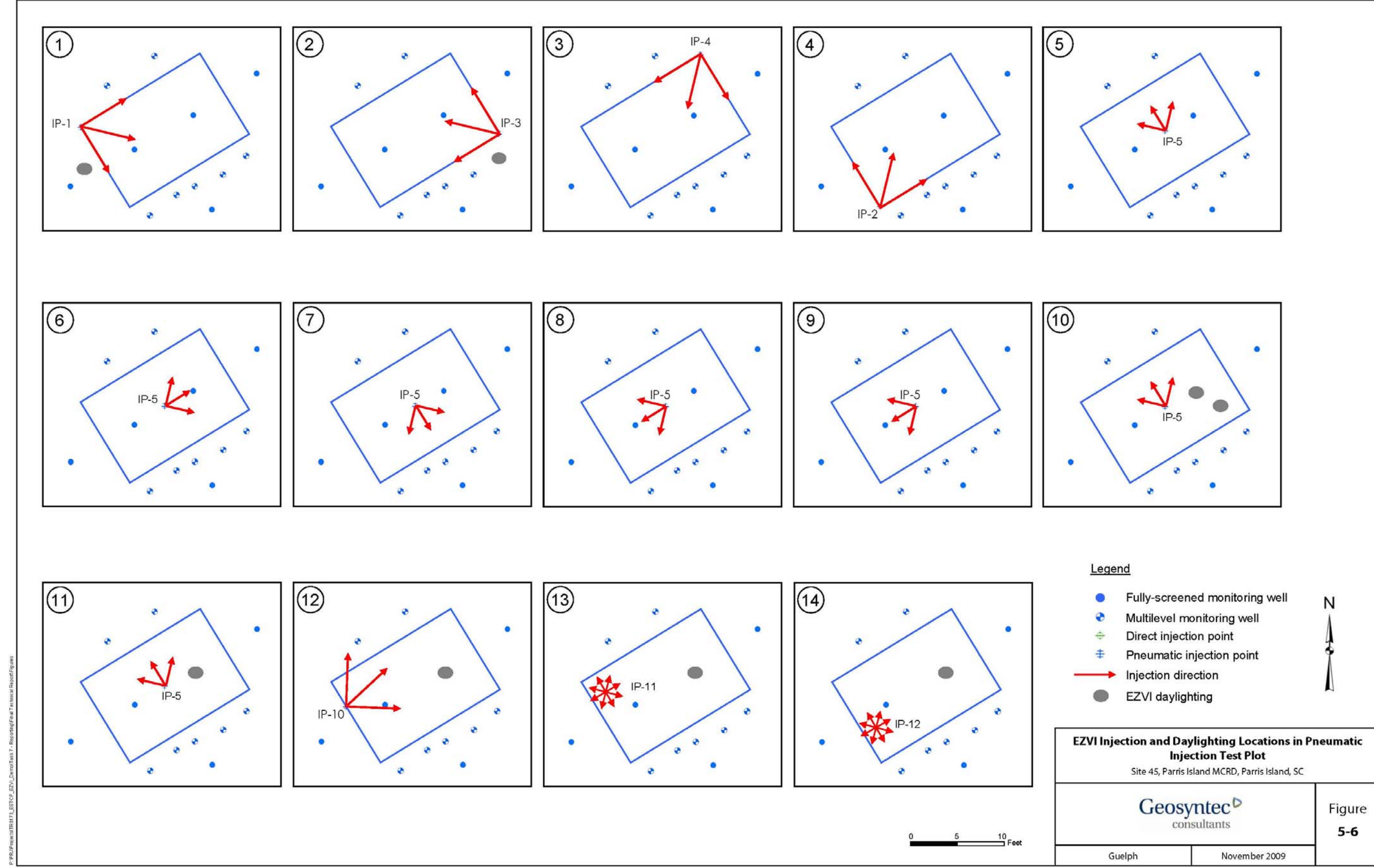
ft bgs - feet below ground surface

injections at each depth) to help promote mixing of the DNAPL and EZVI as the EZVI is pushed back toward the edges of the plot. Any potentially mobile DNAPL would then be pushed out into the soil around the corner injection points. However, there were issues with daylighting and controlling the placement of the EZVI with the first injection location (IP-1) which resulted in a change in injection strategy.

Table 5-4 provides a summary of the volume of EZVI injected at each injection point as well as a summary of the amount and location of any daylighting of EZVI that was observed. Figure 5-6 provides a stepwise diagram of the EZVI injections in the Pneumatic Injection test plot and also depicts where EZVI daylighting was observed during injections. In the 11.5 ft bgs injection interval in IP-1, a small amount of EZVI came to surface approximately 5 ft to the south of the injection tool. Although the pneumatic injection nozzle, which injects over a 90° arc, was placed so that the injection should have been focused into the plot, it is believed that the EZVI came to surface in an old MIP probe hole that provided a short-circuit pathway to surface. As a result, EZVI injection was stopped for IP-1 when the EZVI daylighted and the injection moved to IP-3 (opposite corner from IP-1). During injections at IP-3, EZVI daylighted around the surface completion of ML-3 which was again outside of the 90° target injection interval, but only small amounts of EZVI were coming to surface and the injections were completed at this location.

At IP-2 and IP-4 no daylighting was observed and EZVI was injected over the complete target depth interval. At IP-5, which was located in the center of the plot and was to have injections completed over the complete 360° circumference, injections were stopped after only completing the deepest injection interval for 360° and partially completing the 16.5 and 14 ft depth intervals. At that point significant amounts of EZVI were coming to surface around the surface casing of PMW-6. For a 9 gal injection of EZVI at the 14 ft depth interval, approximately 5 gal of fluid came to the surface (50% assumed to be water and 50% estimated to be EZVI). Pneumatic injection was stopped at this point and the plot allowed to “rest” for approximately 6 hours in hopes that the preferential pathways to surface would have a chance to collapse. A sixth pneumatic injection point, IP-10 was attempted along the southwestern edge of the plot with the nozzle pointing into the center of the plot. A total of 27 gal of EZVI was injected in each of the depth intervals 18 ft bgs, 16 ft bgs and 15 ft bgs, but during each injection event EZVI and water daylighted around PMW-6 and injection was stopped when an estimated 15 gal of fluid were coming to surface.

The amount of EZVI injected into the pneumatic injection plot at the time injections were stopped was only approximately 490 gal, just over half of the target amount of EZVI for this plot. It was decided that an attempt would be made to inject additional EZVI into the pneumatic injection plot using the direct push injection method to try and make up some of the remaining volume of EZVI that needed to be added. Two direct push injection locations, IP-11 and IP-12 were located on the western side of the plot in the area where the highest concentrations of VOCs were located. Injections were focused on the 10 to 14 foot depth interval where the highest concentrations were observed in the soil cores. An additional 70 gal of EZVI were



injected (35 gal at each location) but injections were stopped when fluid was daylighting to surface around PMW-6.

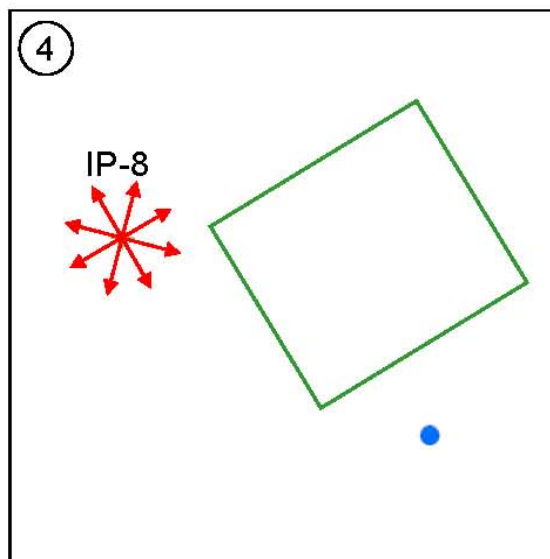
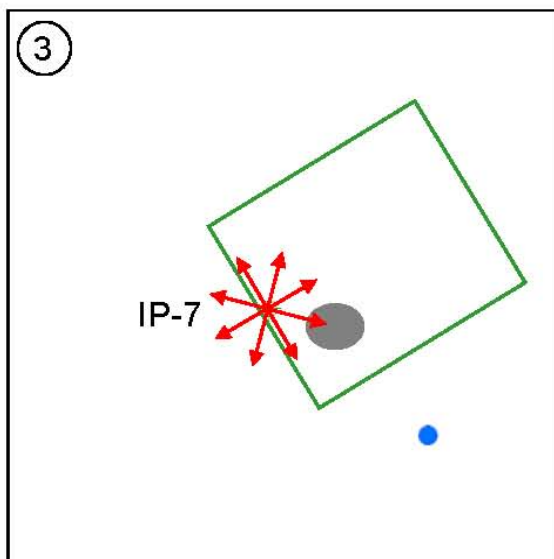
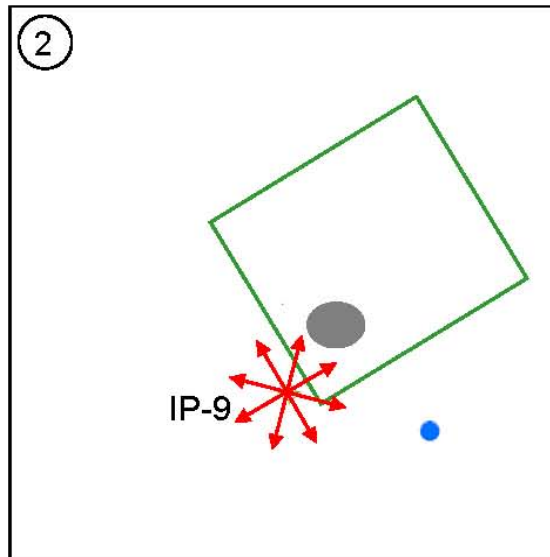
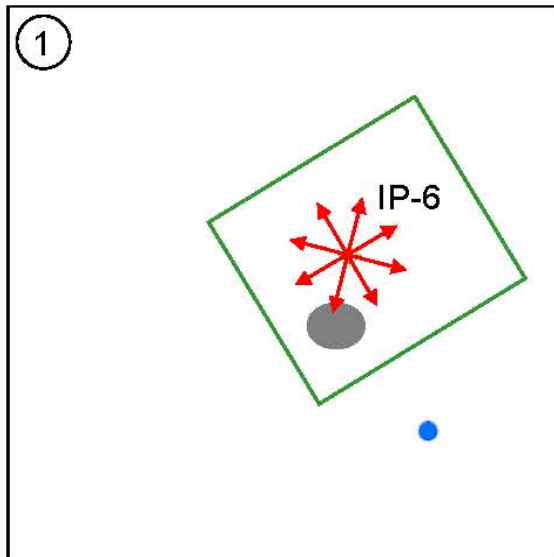
Direct Injection Test Plot

Direct injections were performed by Vironex (of Golden, CO) using a direct push rig. The rig was used to advance a 1.5-inch O.D. injection tooling with a 1-ft injection screen to the bottom of the desired injection interval (12 ft bgs). Once the target depth was reached, an injection cap was attached to the top of the tool string. Grout pumps were then used to inject EZVI and water (at a ratio of 1:3) into the formation at maximum pressures of 50 pounds per square inch (psi). Use of the injection tooling allows the EZVI to be distributed over 1-ft depth intervals. After the first injection was completed, the tooling was retracted upward a distance of 1 ft, and the process repeated. Pump pressures were monitored and logged during all injection events, and are presented in Appendix F. Table 5-4 provides a summary of the volume of EZVI injected at each injection point as well as a summary of the amount and location of any daylighting of EZVI that was observed. Figure 5-7 provides a stepwise diagram of the EZVI injections in the Direct Injection test plot and also depicts where EZVI daylighting was observed during injections.

Injection Monitoring

During EZVI injection in each plot, the injection area was monitored for surface heave and evidence of daylighting or blowby using a graduated heave rod and a surveyor's transit. Daylighting occurs when a vertical fracture or other features such as casings or old boreholes provide a preferential pathway for nitrogen or fluid to the surface. Blowby occurs when nitrogen or injection fluid travels upwards along the side of the nozzle assembly and dissipates at ground surface adjacent to the nozzle. In the Pneumatic Injection test plot, measurements of pressure in select wells were also recorded using pressure gauges at the well head (see Appendix F) and downhole pressure transducers (Levellogger 3001, Solinst Canada Ltd., Georgetown, Ontario, Canada). Plots of pressure transducer data during each day of injections are presented in Appendix E (Figures E-1 to E-5).

Following EZVI injection, soil cores were collected from ten locations (ESC-1 through ESC-10) around the injection points to evaluate the ability of the two injection technologies to provide effective distribution of the EZVI within the source zones (Figure 5-5). A summary of the soil core observations is provided in Table 5-5. Soil cores were collected after all EZVI injections were complete to reduce the likelihood of providing short-circuit pathways through boreholes. As a result, it was not possible to determine which direction the EZVI observed in each soil boring came from. However, inspection of soil cores from locations ESC-1 through ESC-6 suggested good lateral distribution of EZVI within the test plot, as all core locations except for ESC-6 showed evidence of EZVI in at least one soil core. The cores did indicate that the EZVI was not as evenly distributed throughout the target treatment interval as expected and that there was strong indication of fingering or preferential flow paths. It should be noted that during the post-demonstration coring event, two additional soil cores from location ESC-11, which was located ~1 ft from ESC-6, showed evidence of EZVI. During the post-demonstration



Legend

- Fully-screened monitoring well
- + Direct injection point
- Injection direction
- EZVI daylighting



0 5 10 Feet

EZVI Injection and Daylighting Locations in Direct Injection Test Plot

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
consultants

Figure
5-7

Guelph

November 2009

TABLE 5-5: SUMMARY OF EZVI SOIL CORE OBSERVATIONS
Parris Island, South Carolina

Geosyntec Consultants

Injection Plot	Coring Event	Core ID	Date Cored	Depth Interval (ft bgs)	Distance to Nearest EZVI Injection Point (ft)	EZVI Observed	Observations
Pneumatic Injection	Post-Injection	ESC-1	14-Oct-06	4-8	1.6 (IP-3)	Yes	EZVI at ~6.75ft and ~7.5ft
				8-12		Yes	EZVI at ~11.4-11.6ft and ~11.75-12ft
				12-16		No	No EZVI observed (dark sands)
				16-18		No	No EZVI observed (dark sands and peat)
		ESC-2	14-Oct-06	4-8	5.3 (IP-3)	Yes	EZVI lenses at ~7ft and ~7.6ft
				8-12		No	Dark grey clay 8-9.5ft, dark sand 11-12ft
				12-16		No	dark sands
				16-18		No	No EZVI observed
		ESC-3	18-Oct-06	4-8	3.3 (IP-12)	Possible	Possible EZVI at 6, 7 and 7.5ft (dark sands)
				8-12		Possible	Possible EZVI at 10ft (dark sands)
				12-16		Yes	EZVI at ~15ft (by organic/wood piece)
				16-19		No	No EZVI observed (difficult to see b/c of dark clay and peat)
		ESC-4	18-Oct-06	4-8	3.4 (IP-5)	No	No EZVI observed
				8-12		Yes	EZVI at 10ft
				12-16		Yes	a lot of EZVI from ~15.5-16ft (EZVI saturated sand)
				16-19		Yes	EZVI at 18ft (right above peat layer)
		ESC-5	18-Oct-06	4-8	3.4 (IP-3)	Yes	EZVI from 6.5-7ft (saturated sand)
				8-12		Yes	small amount of EZVI at top of core (~8ft)
				12-16		No	No EZVI observed
				16-19		Yes	small amount of EZVI at ~18ft
		ESC-6	18-Oct-06	4-8	4.8 (IP-5)	Possible	Possible EZVI at 5.5ft and 6.8ft
				8-12		No	No EZVI observed
				12-16		No	No EZVI observed (only 1ft recovery)
				16-19		Possible	Possible EZVI at 18.3ft (seen on peat, shiny peat)
Post- Demonstration	Post- Demonstration	ESC-11	19-Mar-09	4-8	4.4 (IP-5)	Yes	EZVI from 5'5"-5'7"
				8-12		Yes/Possible	EZVI 8'5", possible EZVI at 10'4"
				12-16		Possible	Possible EZVI at 13'5"
				16-20		No	No EZVI observed
		ESC-12	19-Mar-09	4-8	2.6 (IP-11)	Possible	Possible EZVI from 5'3"-5'5"
				8-12		Yes	EZVI finger at 8'9"
				12-16		Yes	Small amount of EZVI from 13'3"-13'5" (partially saturated soil), multiple EZVI stringers from 15'1"-15'9" (possible bentonite with EZVI absorbed onto - turned bentonite pale green color)
				16-20		Possible	Possible EZVI from 18'4"-18'5"
		ESC-13	18-Mar-09	4-8	3.4 (IP-12)	Possible/Yes	Possible EZVI from 5'4"-5'5" and at 6', EZVI stringers from 7'-7'7"
				8-12		No	No EZVI observed
				12-16		No	No EZVI observed
				16-20		Possible/Yes	Possible EZVI at 18'10", EZVI at 19'5"
		ESC-14	18-Mar-09	4-8	2.9 (IP-3)	Possible	Possible EZVI from 5'3"-5'5", 6'5"-6'6", and 7'5"
				8-12		No	No EZVI observed
				12-16		Possible	Possible EZVI at 13'4"
				16-20		No	No EZVI observed
		ESC-16	19-Mar-09	4-8	5.9 (IP-3)	Yes	Multiple stringers of EZVI from 5'2"-6', EZVI from 6'6"-6'7"
				8-12		No	No EZVI observed
				12-16		No	No EZVI observed
				16-20		Possible	Possible EZVI at 19'3"
		ESC-17	19-Mar-09	4-8	7.0 (IP-2)	Possible/Yes	Possible EZVI at 4'11", EZVI stringer at 7'8"
				8-12		No	No EZVI observed
				12-16		No	No EZVI observed
				16-20		No	No EZVI observed

TABLE 5-5: SUMMARY OF EZVI SOIL CORE OBSERVATIONS
Parris Island, South Carolina

Geosyntec Consultants

Injection Plot	Coring Event	Core ID	Date Cored	Depth Interval (ft bgs)	Distance to Nearest EZVI Injection Point (ft)	EZVI Observed	Observations
Direct Injection	Post-Injection	ESC-7	18-Oct-06	4-8 8-12	2.8 (IP-8)	Possible Yes	Possible EZVI from 5-6ft, spotty (dark grey spots in lighter gray sand) from 6-7ft, possible EZVI at 7' 10" EZVI at 9' 10", void with EZVI at 10'
		ESC-8	18-Oct-06	4-8 8-12	2.3 (IP-6)	Possible Yes	Possible scattered EZVI from 5.5-7ft (or black sands?) good amount of EZVI from 11-12ft (mainly from 11-11.5ft)
		ESC-9	18-Oct-06	4-8 8-12	1.4 (IP-8)	Possible Yes	Possible scattered EZVI from 6.5-8ft (dark sands) EZVI at 10.5ft (~2 inches)
		ESC-10	18-Oct-06	4-8 8-12	2.2 (IP-8)	Possible Yes	Possible scattered EZVI from 6.5-7.5ft (dark sand spots?) EZVI at 9' 10" and 10' 10"; possible EZVI at 9' (but might be dark clay)
	Post- Demonstration	ESC-15	19-Mar-09	4-8	1.7 (IP-9)	Possible/Yes	Possible EZVI from 5'-6' (speckled black spots), EZVI at 7'6"
				8-12		Possible/Yes	Possible EZVI from 8'6"-8'9" (marble effect dark staining on clay), EZVI at 9'5"
				12-16		Possible	Possible small amount of EZVI at 13'
				16-20		No	No EZVI observed

Notes:

ft - feet

ft bgs - feet below ground surface

sampling event, soil cores from an additional seven locations (ESC-11 through ESC-17) were collected to further evaluate the ability of the two injection technologies to provide effective distribution of the EZVI within the source zones (Figure 5-5). Results of the EZVI soil core collection activities in the Pneumatic Injection test plot suggest a ROI of ~5 ft (the approximate distance from ESC-2 to IP-3 and from ESC-16 to IP-3) for the pneumatic injection technology. As mentioned above, the cores were collected after all the injection activities were completed so it is not possible to say for sure where observed EZVI was actually injected. We have used the most conservative estimate by using the closest injection points as the assumed point of origin.

In the Direct Injection test plot, soil core locations ESC-8 (post-injection cores) and ESC-15 (post-demonstration cores) showed evidence of EZVI in at least one soil core. Moreover, soil cores from ESC-7, ESC-9 and ESC-10 all showed evidence of EZVI in the 8-12 ft cores collected from each location. These results suggest a minimum ROI of ~2.8 ft (the distance from ESC-10 to IP-8) for the direct injection technology.

In addition to EZVI soil cores, ORP measurements were conducted in select fully screened monitoring wells following injection activities (ORP could only be measured in wells PMW-2, PMW-3 and PMW-4, as wells PMW-1, PMW-5 and PMW-6 all displayed evidence of EZVI inside the well and there was a concern of damaging the ORP probe if used in these wells). A summary of ORP measurements is presented in Table 5-6. ORP measurements for wells PMW-2, PMW-3 and PMW-4 ranged from -24.5 mV to -29.4 mV, -37.9 mV to -69.8 mV, and 37.4 mV to 53.1 mV, respectively. However, none of these wells displayed ORP readings that were significantly different from baseline values.

5.6.6 Performance Monitoring Groundwater Sampling

The field sampling events following EZVI injection consisted of groundwater sampling for laboratory analysis. The Gantt Chart in Figure 5-3 presents the groundwater sampling schedule used during the demonstration. For each event, groundwater samples were collected from select fully screened and multilevel monitoring wells and analyzed for either some or all of the parameters initially tested during baseline sampling activities as outlined in Table 5-2.

5.6.7 Post-Demonstration Sampling and Integral Pump Test

In March 2009, a final set of post-demonstration groundwater samples was collected from each of the fully screened and multilevel monitoring wells and was analyzed for the parameters initially tested during baseline sampling activities (Section 5.6.1). A set of post-demonstration soil cores (SC-10 through SC-13) was also collected in the Pneumatic Injection test plot from locations adjacent to the baseline soil cores (Figure 5-8), and cores were analyzed for VOC concentrations to determine post-demonstration VOC mass estimates. VOC extraction from the soil and calculations were performed as described in Section 5.6.1. As was done during baseline sampling, post-demonstration VOC concentrations from wells PMW-5 and PMW-6 were used to calculate estimates of dissolved phase VOC mass in the northeastern and southwestern halves of

TABLE 5-6: SUMMARY OF POST-EZVI INJECTION ORP MEASUREMENTS
Parris Island, South Carolina

Geosyntec Consultants

Well ID	Date	Total Depth of Well (ft bgs)	Time	Probe Depth (ft bgs)	Temperature (°C)	ORP (mV)	Comments
PMW-1	18-Oct-06	13.5	--	--	--	--	EZVI on waterra tubing, did not measure ORP due to concern of damaging probes
PMW-2	18-Oct-06	19.0	12:05 PM	9.0	--	--	probe in well
			12:26 PM	9.0	25.3	-24.5	soil coring by DP occuring within 20ft
			12:31 PM	9.0	25.2	-29.0	soil coring by DP occuring within 20ft
			12:37 PM	9.0	25.2	-29.4	soil coring by DP occuring within 20ft
PMW-3	18-Oct-06	19.0	12:42 PM	10.0	--	--	probe in well
			12:44 PM	10.0	24.9	-37.9	soil coring by DP occuring within 20ft
			1:29 PM	10.0	25.0	-54.9	soil coring by DP occuring within 20ft
			1:43 PM	10.0	25.0	-40.8	soil coring by DP occuring within 20ft
			1:48 PM	10.0	25.0	-30.6	soil coring by DP occuring within 20ft
			2:53 PM	10.0	25.0	-45.5	soil coring by DP occuring within 20ft
			2:54 PM	14.0	--	--	probe lowered to 14 ft
			2:55 PM	14.0	24.7	-52.5	soil coring by DP occuring within 20ft
			3:13 PM	14.0	24.6	-69.8	soil coring by DP occuring within 20ft
			3:20 PM	14.0	24.6	-69.8	soil coring by DP occuring within 20ft
PMW-4	18-Oct-06	19.0	3:26 PM	10.0	--	--	probe in well
			3:27 PM	10.0	24.9	53.1	soil coring by DP occuring within 20ft
			3:34 PM	10.0	24.8	42.4	soil coring by DP occuring within 20ft
			3:50 PM	10.0	24.8	38.3	soil coring by DP occuring within 20ft
			3:58 PM	10.0	24.8	38.0	soil coring by DP occuring within 20ft
			3:59 PM	14.0	--	--	probe lowered to 14 ft
			4:00 PM	14.0	24.3	37.4	soil coring by DP occuring within 20ft
			4:05 PM	14.0	24.2	37.7	soil coring by DP occuring within 20ft
PMW-5	18-Oct-06	19.0	--	--	--	--	EZVI on waterra tubing, did not measure ORP due to concern of damaging probes
							EZVI on waterra tubing, did not measure ORP due to concern of damaging probes
PMW-6	18-Oct-06	19.0	--	--	--	--	EZVI on waterra tubing, did not measure ORP due to concern of damaging probes

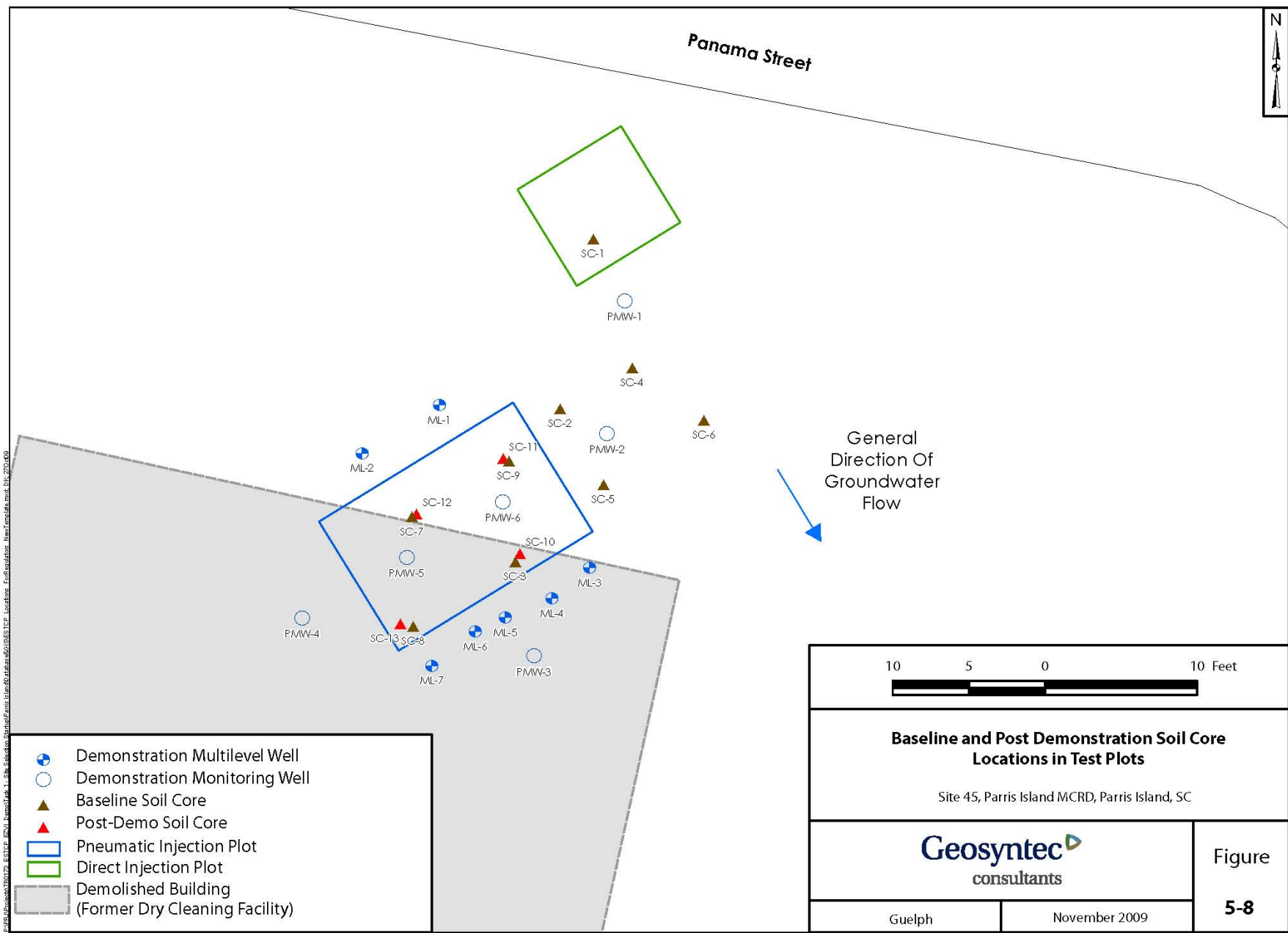
Notes:

ft bgs - feet below ground surface

°C - degrees Celsius

mV - millivolts

-- - not measured



the Pneumatic Injection test plot, respectively and the estimate of the sorbed and DNAPL mass were determined using SC-10 through SC-13.

Following groundwater and soil core collection, a post-demonstration IPT was conducted in order to evaluate the change in contaminant mass flux from the Pneumatic Injection test plot over the treatment duration. The post-demonstration IPT was conducted using the same method as the pre-injection IPT (Section 5.6.2), where groundwater was extracted from well PMW-3 at a rate of approximately 1 gpm for 16 hours using a submersible pump. Samples of the extracted groundwater were collected from the pump discharge at pre-determined times for analysis of VOCs and DHGs. A summary of the VOC concentrations during the post-injection IPT is presented in Table 5-7. The extracted water was stored in an on-site storage tank for subsequent treatment and disposal.

Estimates of VOC and ethene mass fluxes were calculated as described in Section 5.6.2, and were compared to estimates calculated from the pre-injection IPT in order to assess the change in contaminant mass flux from the Pneumatic Injection test plot over the EZVI treatment duration. Results of the mass flux estimate calculations are summarized in Section 5.8.4. Detailed mass flux calculation data is presented in Appendix E (Tables E-46 and E-47).

5.6.8 Groundwater Elevation Monitoring

During select sampling events at the Site, a set of groundwater elevations were measured using select water table wells in the area of the test plots. This data was used to determine detailed groundwater flow directions and gradients at the time of sampling in order to calculate groundwater velocities over the duration of the performance monitoring period. The groundwater velocities were used to calculate the mass flux estimates for the baseline, post-injection, performance monitoring and post-demonstration sampling events. The gradient at the site is very flat (Figure 4-3) and there was little change in gradient over the duration of the investigation. Groundwater elevation data is presented in Appendix C.

5.6.9 Shut-down/Demobilization

The USEPA has elected to continue groundwater sampling at the site and thus the demonstration wells were not abandoned following the final groundwater sampling event for this demonstration. In addition, the wells may be used by Site 45 MCRD personnel to monitor groundwater quality at the Site. All wastes, equipment, and supplies were removed at the end of the March 2009 sampling event.

5.6.10 Disposal of IDW

All soils and water generated during well installation, soil sampling, well purging, and equipment cleaning were containerized by the drilling or sampling personnel in approved Department of Transportation (DOT) 55-gal drums. The drums were sealed, labeled and transported to a designated storage area on the base as directed by MCRD. All other common,

TABLE 5-7: SUMMARY OF POST-DEMONSTRATION IPT VOC AND DHG CONCENTRATIONS
Parris Island, South Carolina

Geosyntec Consultants

Sample ID: Sample Date: Time sampled (hr):	PMW3-15M 20-Mar-09 0.25	PMW3-30M 20-Mar-09 0.5	PMW3-1H 20-Mar-09 1	PMW3-2H 20-Mar-09 2	PMW3-4H 20-Mar-09 4	PMW3-8H 20-Mar-09 8	PMW3-12H 20-Mar-09 12	PMW3-16H 21-Mar-09 16
<u>VOCs (µg/L)</u>								
1,1-Dichloroethene	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
cis-1,2-Dichloroethene	13,000	14,000	15,000	14,000	15,000	19,000	23,000	24,000
Tetrachloroethene	880	790	570	380	260	220	180	160
trans-1,2-Dichloroethene	140	140	140	140	140	190	160	180
Trichloroethene	940	810	640	490	350	300	230	220
Vinyl Chloride	5,000	4,200	3,900	3,100	3,100	3,700	3,000	3,100
<u>Dissolved Hydrocarbon Gases (mg/L)</u>								
Acetylene	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Ethane	0.17	0.21	0.26	0.33	0.30	0.32	0.39	0.37
Ethene	1.4	1.4	1.3	1.3	1.3	1.4	1.5	1.4
Methane	7.6	7.9	8.1	7.5	8.5	9.4	11	10

Notes:

IPT - Integral pump test

U - parameter was not detected, associated value is quantitation limit

µg/L - micrograms per liter

mg/L - milligrams per liter

non-hazardous trash associated with the demonstration was disposed of according to MCRD protocols.

5.7 ANALYTICAL METHODS

The analytical methods used to analyze groundwater and soil samples are presented in Table 5-8. Information pertaining to calibration of analytical equipment, quality assurance, decontamination, and sample documentation can be found in Appendix D.

5.8 SAMPLING RESULTS

In the following sections, the analytical results are summarized. Water level elevation data can be found in Section 5.8.1, field parameters in Section 5.8.2, geochemical parameters in Section 5.8.3, and VOC data in Section 5.8.4. A complete compilation of the analytical data can be found in Appendix E. All VOC, DHG, and VFA data were validated using USEPA data qualifiers for organic and inorganic data (USEPA 540-R-08-01 and 540-R-04-004). A summary of the data validation results and findings is presented in Appendix G.

5.8.1 Water Level Elevation Data

The gradient at the site is very flat (Figure 4-3) and there was little change in gradient over the duration of the investigation. A complete compilation of measured water level elevations is presented in Appendix C. It is possible that the gradient may have reversed for short periods of time through the plot during the demonstration. However, with the gradient as flat as it is, the changes in water levels measured in the wells within the plot were very small and often within the margin of measurement error. The estimated gradient used in the mass flux calculations was 0.0026 ft/ft.

5.8.2 Field Parameters

Following EZVI injections in the Pneumatic and Direct Injection test plots the following groundwater field parameter trends were observed. A summary of the field parameter data is provided in Appendix E (Tables E-11 to E-30).

Pneumatic Injection Test Plot

- A moderate decrease in pH in some of the downgradient multilevel wells (ML-3-4, ML-4-7, ML-5-5, ML-6-4 to ML-6-6, and ML 7-3 to ML-7-5), with pH measurements dropping by as much as 1 pH unit in these wells by the post-demonstration sampling event.
- A general decrease in ORP in the fully screened monitoring wells and most of the multilevel wells (ML-1-5, ML-1-7, ML-2-3, ML-2-5, ML-2-7, ML-5-4, ML-5-5, ML-6-4 to ML-6-7, and ML-7-4 to ML-7-6), with ORP measurements dropping by as much as 250 millivolts (mV) in these wells by the post-demonstration sampling event. However,

TABLE 5-8: PERFORMANCE OBJECTIVES
Parris Island, South Carolina

Geosyntec Consultants

	Parameter	Analytical Method	Method Number	Analytical Laboratory	Quantitation Limit	Sample Container	Preservative	Holding Time
	Field Parameters (DO, ORP, pH, temperature, conductivity, turbidity)	Multiprobe System	Field	NA	Varies	Flow-through cdl	None	NA
GROUNDWATER	Field Parameters (sulfide, ferrous iron, alkalinity)	Field Kits	Field	NA	0.01 mg/L for sulfide and Fe(II), 2 mg/L for alkalinity	100 mL plastic (sulfide and ferrous iron)	None	NA
	VOCs (PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, vinyl chloride)	Gas Chromatography /Mass Spectrometry	EPA 8260B	CAS	as low as 1 µg/L	3 x 40 mL VOA	sulfuric acid to pH<2, cool to 4°C	14 days
	Dissolved Hydrocarbon Gases (methane, ethane, ethene)	Gas Chromatography/ Flame Ionizing Detector	RSK-175	CAS	as low as 1 µg/L	3 x 40 mL VOA	sulfuric acid to pH<2, cool to 4°C	14 days
	Anions (chloride, sulfate, bromide, fluoride, nitrate, nitrite)	Capillary Ion Electrophoresis	Waters	USEPA	0.2 mg/L for nitrate and nitrite, 1.0 mg/L for the rest	30 mL plastic	cool to 4°C	2 to 28 days
	Anions (nitrate + nitrite)	Flow Injection Colorimetry	Lachat 10-107-04-2-A	USEPA	0.1 mg/L	30 mL plastic	sulfuric acid to pH < 2, cool to 4°C	6 to 13 days
	VFAs	Gas Chromatography/ Flame Ionizing Detector	EPA 8015-Mod	STL/CAS	as low as 0.5 mg/L	3 x 40 mL VOA	cool to 4°C	14 days
	TOC	UV-promoted Wet Chemical Oxidation	EPA 415.1	USEPA	0.5 mg/L	40 mL glas	sulfuric acid to pH<2, cool to 4°C	28 days
	Cations/Dissolved Metals	Inductively Coupled Plasma- Optical Emission Spectrometry	EPA 6010B	USEPA	4 to 307 µg/L	60 mL plastic	nitric acid to pH<2, cool to 4°C	21 days
SOIL	VOCs (PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, vinyl chloride)	Gas Chromatography /Mass Spectrometry	Mod. EPA 8260B ⁽⁴⁾	STL	as low as 290 µg/kg	3 x 40 mL VOA	hydrochloric acid to pH<2, cool to 4°C	14 days
	EZVI	Visual/Microscopic	NA	NA	NA	Butyrate or acetate sleeve	None	NA
	f _{oc}	Walkley Black	Walkley Black	STL	610-1900 mg/kg	8oz plastic	cool to 4°C	28 days
	Porosity	Water Pycnometer/Drive-Cylinder	ASTM D854, ASTM D2937	STL	0.1%	16oz glass	None	NA

Notes:

NA - Not Applicable

CAS - Columbia Analytical Services, Inc.

STL - Severn Trent Laboratories, Inc.

EPA - EPA GWERD National Risk Management Research Laboratory, Ada, OK

(a) - Samples extracted using methanol on site. See Appendix B of the Demonstration Plan (Geosyntec, 2006b) for the detailed extraction procedure

TBD - To be determined

most wells exhibited a large degree of variability and fluctuation in groundwater ORP throughout the demonstration, thus making it difficult to assess areas where a true reduction in ORP was achieved. As such the reader is directed to Tables E-11 TO E-20 and Figures E-6 to E-53 in Appendix E for groundwater ORP trends rather than trying to depict this using plan view maps. Other multilevel wells also exhibited some decrease in ORP following EZVI injection; but by the post-demonstration sampling event, ORP measurements had rebounded to near baseline levels in these wells.

- Dissolved oxygen concentrations were low before injection and remained relatively constant over the demonstration period, with most wells exhibiting DO concentrations below 2 mg/L.
- Increases in ferrous iron concentration in the fully screened monitoring wells (including PMW-2 and PMW-4).
- Significant increases in sulfide concentrations in the fully screened monitoring wells (including PMW-2).

Direct Injection Test Plot

- pH levels in PMW-1 remained relatively constant between 5.8 and 6.3 over the demonstration period, and were near baseline levels by the post-demonstration sampling event.
- Virtually no change in groundwater OPR between the baseline and post-demonstration sampling events (although ORP measurements in PMW-1 did fluctuate between -88.5 mV and -169.9 mV over the demonstration period).
- Dissolved oxygen concentrations decreased from approximately 1.5 mg/L to near zero (or non-detect) following EZVI injections, but had returned to near baseline concentrations by the January 2008 sampling event (after which time DO concentrations decreased once again).
- Increases in ferrous iron concentration, and significant increases in sulfide concentration.

5.8.3 Geochemical Parameters

A summary of the geochemical parameter data, which include results of alkalinity, DHG and VFA samples, is provided in Appendix E (Tables E-21 to E-30, E-32 and E-33). Results of TOC and dissolved metals samples are provided in Appendix E: Data Collected by USEPA. Following EZVI injection into the Pneumatic Injection test plot, significant increases in groundwater VFA concentrations (primarily acetic, butyric and propionic acids) were observed in the downgradient multilevel wells and in fully screened wells PMW-5 and PMW-6. Significant increases in VFA concentrations were also observed in upgradient well ML-2-3 indicating that some EZVI may have moved outside the plot to the north although no EZVI was

observed in the upgradient wells. Relatively little change in groundwater alkalinity was observed in any of the wells throughout the demonstration. Methane concentrations increased in upgradient well ML-1, in the downgradient multilevel wells, and in the fully screened wells (except PMW-4). Concentrations of ethene and ethane also increased in one of the upgradient wells (ML-2), in the downgradient multilevel wells (except ML-3), and in all fully screened wells except for PMW-2 and PMW-6 (ethene only) (Figures 5-9 to 5-13 ethene data). Following EZVI injection into the Direct Injection test plot, concentrations of ethene and methane increased in the downgradient fully screened well PMW-1 (Figure 5-14 ethene data).

5.8.4 Volatile Organic Compound Data

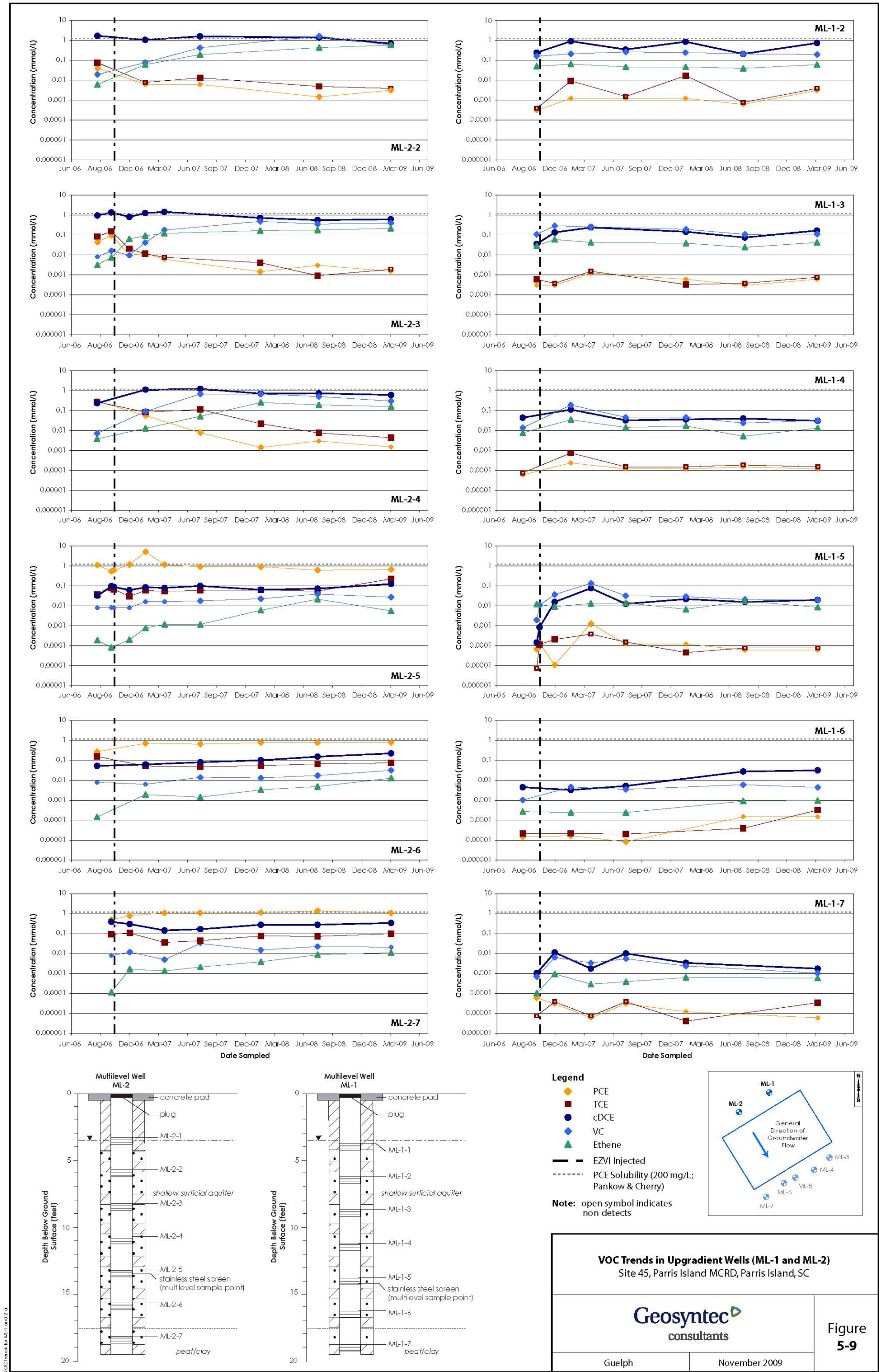
Groundwater and Soil VOC Concentrations

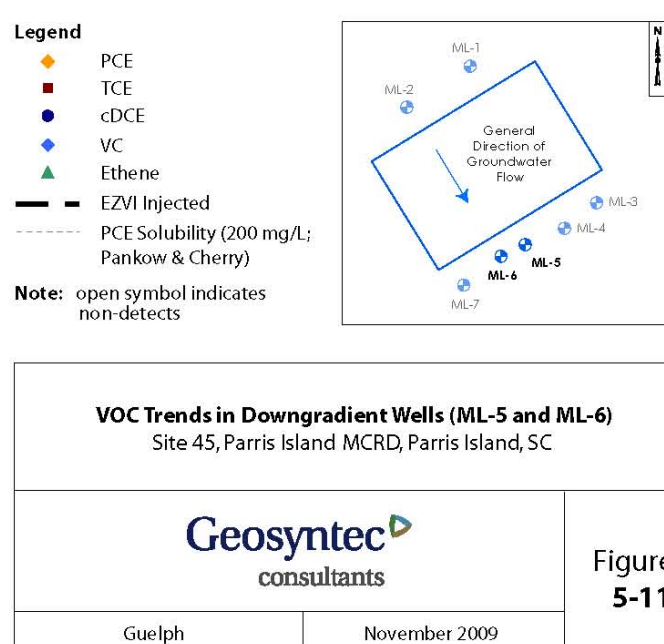
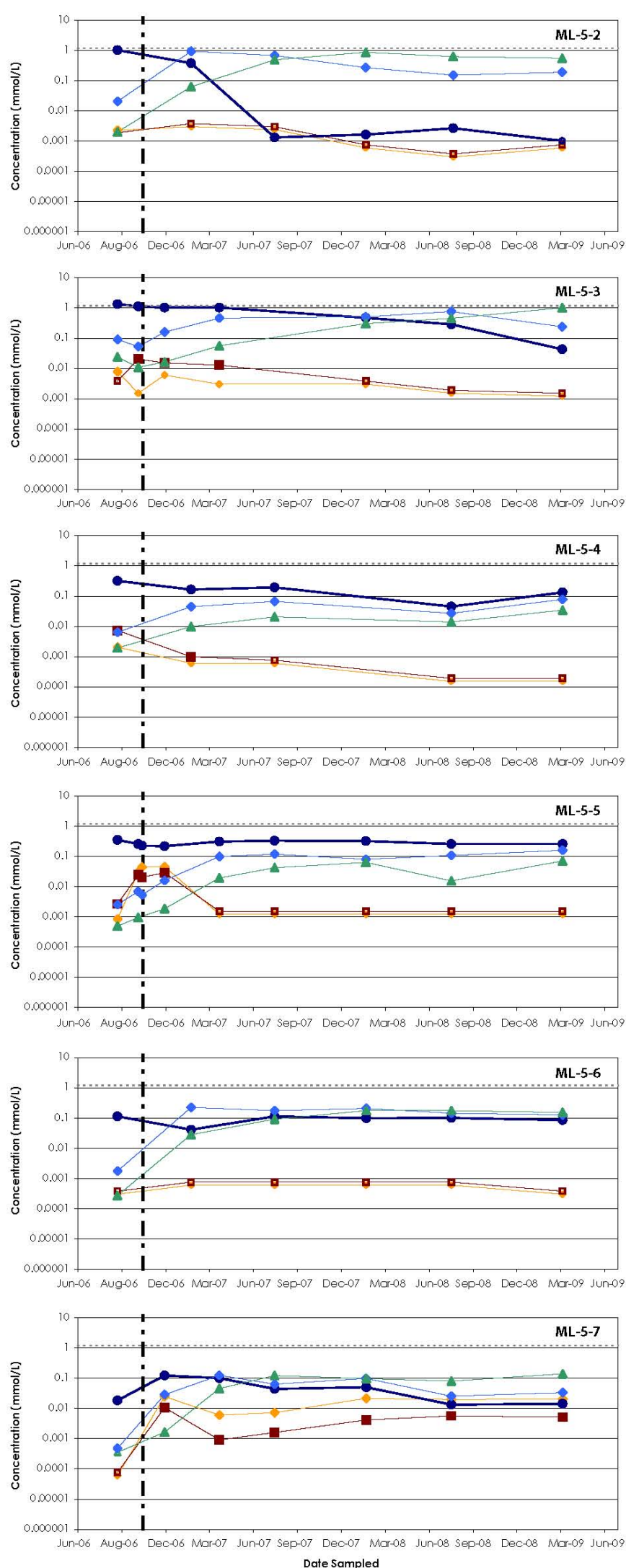
Using results from the baseline groundwater and soil sampling events, the total mass of target VOCs in the Pneumatic Injection test plot was estimated to be approximately 38 kilograms (kg) (Table 5-9), of which roughly 29 kg (or ~76%) is attributed to PCE DNAPL. Following injection of EZVI, downgradient multilevel wells and fully screened wells PMW-3, PMW-5 and PMW-6 showed significant decreases in PCE and TCE concentrations, with an increase in the concentration of degradation products (Figures 5-9 to 5-13). Post-demonstration sampling results were used to calculate a target VOC total mass of approximately 5.6 kg (Table 5-9) in the Pneumatic Injection test plot, of which roughly 2.1 kg (or ~38%) is attributed to PCE DNAPL. Injection of EZVI into the Pneumatic Injection test plot resulted in approximately 93% reduction in the estimated mass of PCE DNAPL, and approximately 85% reduction in the total mass of target VOCs. Detailed calculations of VOC mass estimates are provided in Appendix E (Tables E-5 to E-10).

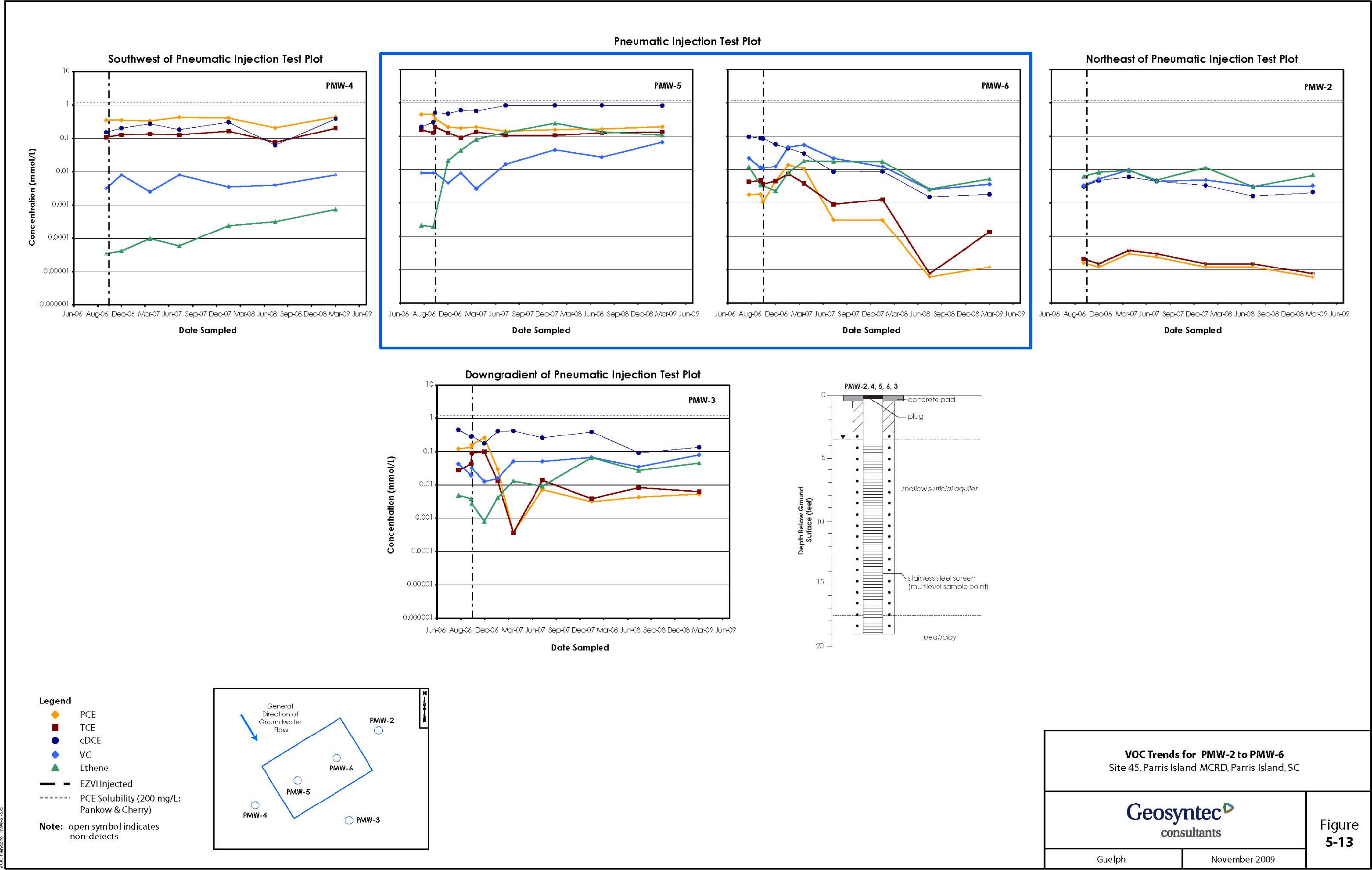
Prior to EZVI injections, soil core VOC data suggested that DNAPL was present within the areas of SC-1 (6-8 ft bgs), SC-3 (4-6 ft bgs), SC-7 (4-10 ft bgs and 12-16 ft bgs), and SC-8 (12-16 ft bgs) (see Figure 5-8 for soil core locations and Table E-3 for PCE concentrations indicating presence of DNAPL). Groundwater VOC data also suggested that DNAPL was located very near well ML-2-5 and PMW-5 which had baseline groundwater PCE concentrations near saturation and DNAPL was actually pumped out of ML-2-5 before EZVI was injected. Wells PMW-4, PMW-6, ML2-7, ML-7-5 and ML-6-5 also had very high PCE concentrations indicating the presence of nearby DNAPL. A complete compilation of pre-injection soil core and groundwater VOC data is presented in Appendix E (Tables E-3 and E-31).

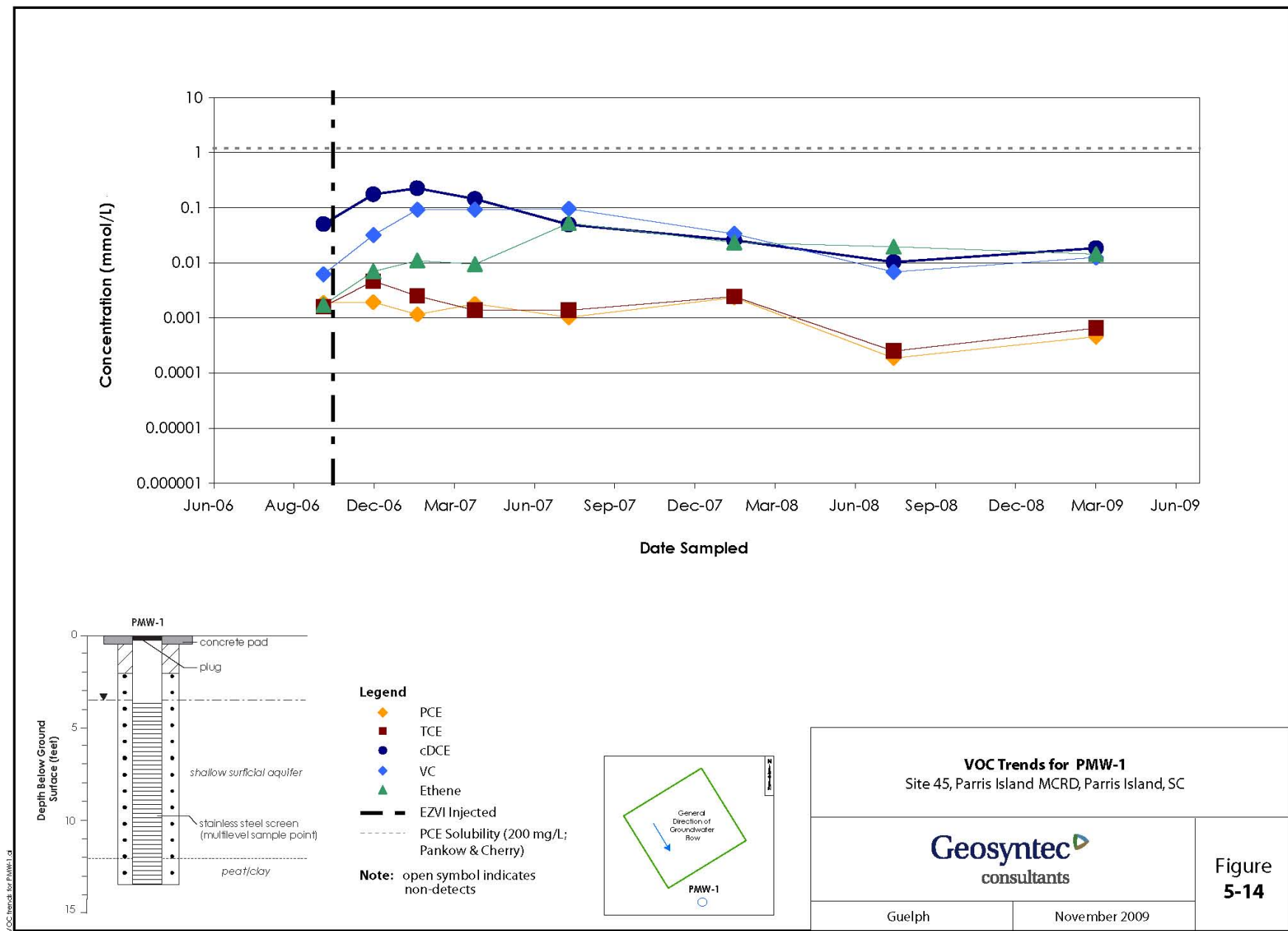
After the injection of EZVI into the pneumatic injection plot, DNAPL was still being pumped from ML-2-5 but was also being pumped from wells PMW-4, PMW-5, and ML-2-7 where a separate DNAPL was not seen prior to injection. This indicates that DNAPL moved in the subsurface during or soon after EZVI injection.

The groundwater VOC concentrations in PMW-4, located outside of the target treatment area of the Pneumatic Injection test plot where little to no EZVI should have been delivered, did not change significantly after the injections, despite a small amount of non-aqueous phase now









**TABLE 5-9: PRE-INJECTION AND POST-DEMONSTRATION VOC MASS
ESTIMATES IN PNEUMATIC INJECTION PLOT
Parris Island, South Carolina**

Geosyntec Consultants

Media	VOC	Pre-Injection Mass (g)			Post-Demonstration Mass (g)		
		Sorbed/Dissolved	DNAPL	Total	Sorbed/Dissolved	DNAPL	Total
Soil ¹	Tetrachloroethene	2,760	29,028	31,788	730	2,137	2,867
	Trichloroethene	1,317	0	1,317	521	0	521
	cis-1,2-Dichloroethene	1,254	0	1,254	569	0	569
	Vinyl Chloride	2,214	0	2,214	114	0	114
Groundwater ²	Tetrachloroethene	577	0	577	333	0	333
	Trichloroethene	267	0	267	182	0	182
	cis-1,2-Dichloroethene	588	0	588	819	0	819
	Vinyl Chloride	12	0	12	45	0	45
Total Mass (g)		8,990	29,028	38,018	3,312	2,137	5,449
% Reduction³					63%	93%	86%

Notes:

g - grams

¹ - Soil data based on SC-1 through SC-9 for Pre-Injection data and SC-10 and SC-13 for the Post-Demonstration sampling

² - Groundwater data is based on PMW-5 and PMW-6, the two fully screened wells within the plot

³ - Reductions calculated using pre-injection and post-demonstration total mass estimates

being present in the well (Figure 5-13 and Table E-31 in Appendix E). This would appear to indicate that if DNAPL was mobilized into this well during injection it must have been in close proximity to the well prior to injection activities. It is possible that the EZVI injection actually pushed DNAPL into this well or that the injection activities created fractures or preferential pathways that allowed DNAPL to migrate to this well post-injection.

Well PMW-5 within the Pneumatic Injection test plot actually had a slight decrease in PCE concentrations and a corresponding increase in cDCE after injection of EZVI (Figure 5-13 and Table E-31 in Appendix E), but during each sampling event a DNAPL was pumped from this well. The increase in cDCE would have lowered the saturation concentration of PCE which may account for some of the decrease in PCE concentrations despite the presence of a DNAPL phase. The DNAPL pumped from ML-2-5 during the pre- and post-injection sampling was very dark brown to black in color and the DNAPL pumped from PMW-5 was similar and may have consisted of PCE mixed with EZVI. Although DNAPL was being pumped from PMW-5 and PCE and other VOC concentrations remained elevated, there was significant ethene production measured (Figure 5-13 and Table E-31 in Appendix E) in this well with an increase from 5.6 µg/L just prior to EZVI injections to 2,800 µg/L during the post-demonstration sampling event, indicating that degradation is ongoing in this area (the maximum ethene concentration observed in this well was 7,200 µg/L in January 2008).

ML-2-7 (18.5 ft bgs) did have an increase in PCE concentrations after injection of EZVI (Figure 5-9 and Table E-31 in Appendix E) and DNAPL was present in this point in post-injection sampling events. DNAPL was present near this point prior to EZVI injection as it was being pumped out of ML-2-5 (13.5 ft bgs), and the injection activities appear to have either pushed the DNAPL to this location or provided a fracture or preferential flow path that allowed DNAPL to migrate to this screened interval.

Soil core VOC data from the post-demonstration sampling event (Table E-3 in Appendix E) suggested that DNAPL was only present within the area of SC-12 (4-8 ft bgs and 12-14 ft bgs) which was cored only a few inches from SC-7 which is the closest core to ML-2 (Figure 5-8).

Based on the presence of DNAPL in the four wells (ML-2-5, ML-2-7, PMW-4 and PMW-5) post-EZVI injection, it appears that there was more DNAPL present in the plot than the pre-demonstration estimate suggested. Although there is evidence that some DNAPL may have been mobilized outside of the plot (DNAPL in PMW-4 and ML-2-7) there is evidence of a lot of degradation within and downgradient of the plot as evidenced by the increase in concentrations of daughter products (VC and ethene) indicating that mass was not just displaced but degraded.

In the Direct Injection test plot, PMW-1 exhibited slight decreases in PCE and TCE concentrations following injection of EZVI, with a moderate increase in the concentration of degradation products (Figure 5-14).

Pneumatic Injection Test Plot Mass Flux Estimates

Pre- and post-EZVI injection estimates of VOC and ethene mass fluxes for the Pneumatic Injection test plot were calculated using groundwater concentrations in the upgradient (ML-1 and ML-2) and downgradient (ML-3 through ML-7) multilevel well transects. Mass flux estimates were also calculated using results from the IPTs and were then compared to mass flux estimates from the downgradient (ML-4, ML-5 and ML-6) multilevel wells.

Mass flux estimates from the multilevel well transects were calculated using Pre-injection and post-demonstration VOC and ethene concentrations from the upgradient (ML-1 and ML-2) and downgradient (ML-3 through ML-7) multilevel wells, and by assuming an effective cross sectional area (perpendicular to groundwater flow) for each multilevel well. A depth to water of 3.4 ft bgs and a total depth of 20 ft bgs were also used for the calculations. Pre-injection mass flux estimates were calculated using VOC results grouped from the August and October 2006 baseline sampling events, since not all upgradient and downgradient wells were sampled during each event. Similarly, VOC data from the November 2006 and January 2007, March and July 2007, and January and July 2008 sampling events were grouped since not all wells were sampled during these events. The total change in mass flux for both upgradient and downgradient multilevel well transects was then calculated by comparing pre- injection and post-demonstration mass flux estimates. Table 5-10 provides a summary of the mass flux estimates as well as the total change in mass flux (as percent reduction) for the upgradient and downgradient multilevel wells. Figures 5-15 through 5-17 show the change in mass flux graphically. Detailed calculations are provided in Appendix E (Tables E-34 to E-42).

The Pneumatic Injection plot was located in an area that had DNAPL upgradient of the plot as well as within the plot. Multilevel wells were installed on the upgradient side of the plot to evaluate the concentrations that were flowing into the plot over the period of performance. Comparison of the pre- and post-EZVI injection mass flux estimates in multilevel wells on the upgradient side of the test plot revealed an increase in mass flux for all VOCs except for TCE and cDCE (Table 5-10 and Figure 5-15). The mass flux of ethene in the upgradient multilevel well transect also increased significantly. The increase in ethene and decrease in TCE and cDCE in the upgradient wells indicates increased degradation in this area. This increased degradation may mean that some EZVI was distributed to this area during injection or simply that there is increased biodegradation in the area around the EZVI due to oil separation and oil breakdown products from the EZVI.

Comparison of pre-injection and post-demonstration mass flux estimates calculated using VOC concentrations from multilevel wells ML-3 through ML-7 on the downgradient side of the test plot revealed significant reductions in mass flux of the parent compounds PCE (~85% reduction) and TCE (~86% reduction), and of the degradation product cDCE (~71% reduction) (Table 5-10 and Figures 5-15 to 5-17). In contrast, the mass flux of the degradation products VC and ethene increased significantly over the test period. The increase in ethene mass flux indicates that the reduction in PCE, TCE and cDCE concentrations were due to degradation and

TABLE 5-10: VOC MASS FLUX ESTIMATES IN PNEUMATIC INJECTION PLOT BASED ON MULTILEVEL WELL MONITORING DATA
Parris Island, South Carolina

Geosyntec Consultants

	Units	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride	Total CEs	Ethene
<u>Pre-Injection (August & October 2006) Mass Flux</u>							
Upgradient MLs ¹	mmol/yr/ft ²	1,040.0	245.4	2,041.8	161.8	3,526.9	54.5
Downgradient MLs ²	mmol/yr/ft ²	101.9	49.7	1,846.4	246.2	2,289.1	52.2
% Reduction Across Plot		90.2%	79.7%	9.6%	-52.1%	35.1%	4.1%
<u>Post-Injection (November 2006 & January 2007) Mass Flux</u>							
Upgradient MLs ¹	mmol/yr/ft ²	3,647.1	127.6	2,135.7	321.3	6,293.3	133.5
Downgradient MLs ²	mmol/yr/ft ²	58.5	40.5	914.4	1,104.0	2,151.6	292.9
% Reduction Across Plot		98.4%	68.3%	57.2%	-243.6%	65.8%	-119.4%
<u>Post-Injection (March & July 2007) Mass Flux</u>							
Upgradient MLs ¹	mmol/yr/ft ²	1,343.1	100.0	2,147.7	703.1	4,366.0	240.5
Downgradient MLs ²	mmol/yr/ft ²	5.7	5.4	617.1	931.4	1,576.8	513.5
% Reduction Across Plot		99.6%	94.6%	71.3%	-32.5%	63.9%	-113.5%
<u>Post-Injection (January & July 2008) Mass Flux</u>							
Upgradient MLs ¹	mmol/yr/ft ²	1,431.3	117.0	2,257.7	1,781.8	5,663.3	466.0
Downgradient MLs ²	mmol/yr/ft ²	6.3	12.1	647.8	583.9	1,261.5	1,238.6
% Reduction Across Plot		99.6%	89.7%	71.3%	67.2%	77.7%	-165.8%
<u>Post-Demonstration (March 2009) Mass Flux</u>							
Upgradient MLs ¹	mmol/yr/ft ²	1,271.6	217.2	1,690.9	796.2	4,044.2	612.7
Downgradient MLs ²	mmol/yr/ft ²	15.4	7.0	531.2	422.0	986.6	883.2
% Reduction Across Plot		98.8%	96.8%	68.6%	47.0%	75.6%	-44.2%
<u>Pre-Injection vs Post-Demonstration % Reduction in Mass Flux³</u>							
% Reduction in Downgradient MLs ²		84.8%	86.0%	71.2%	-71.4%	56.9%	-1590.7%

Notes:

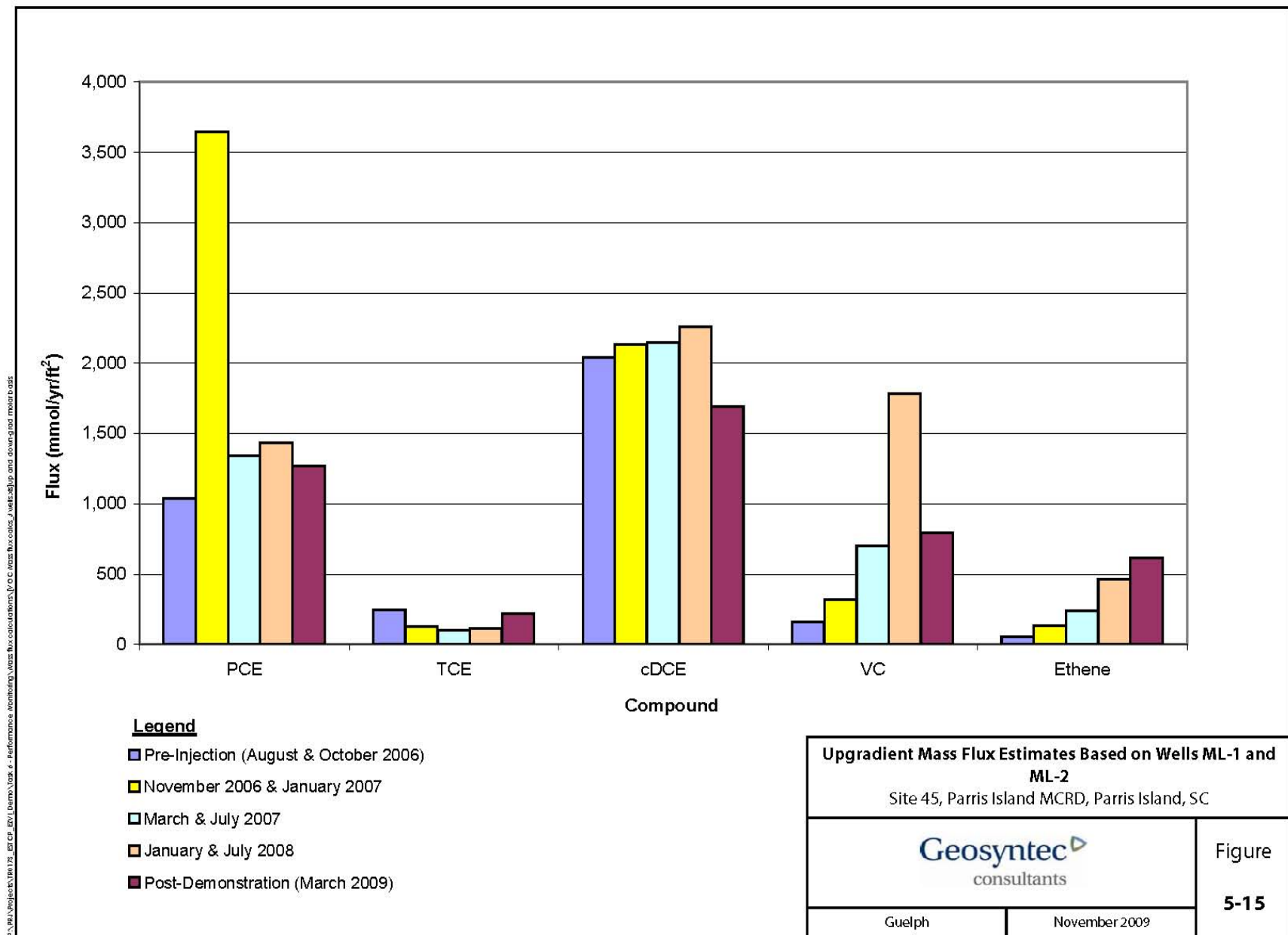
mmol/yr/ft² - millimols per year per square foot

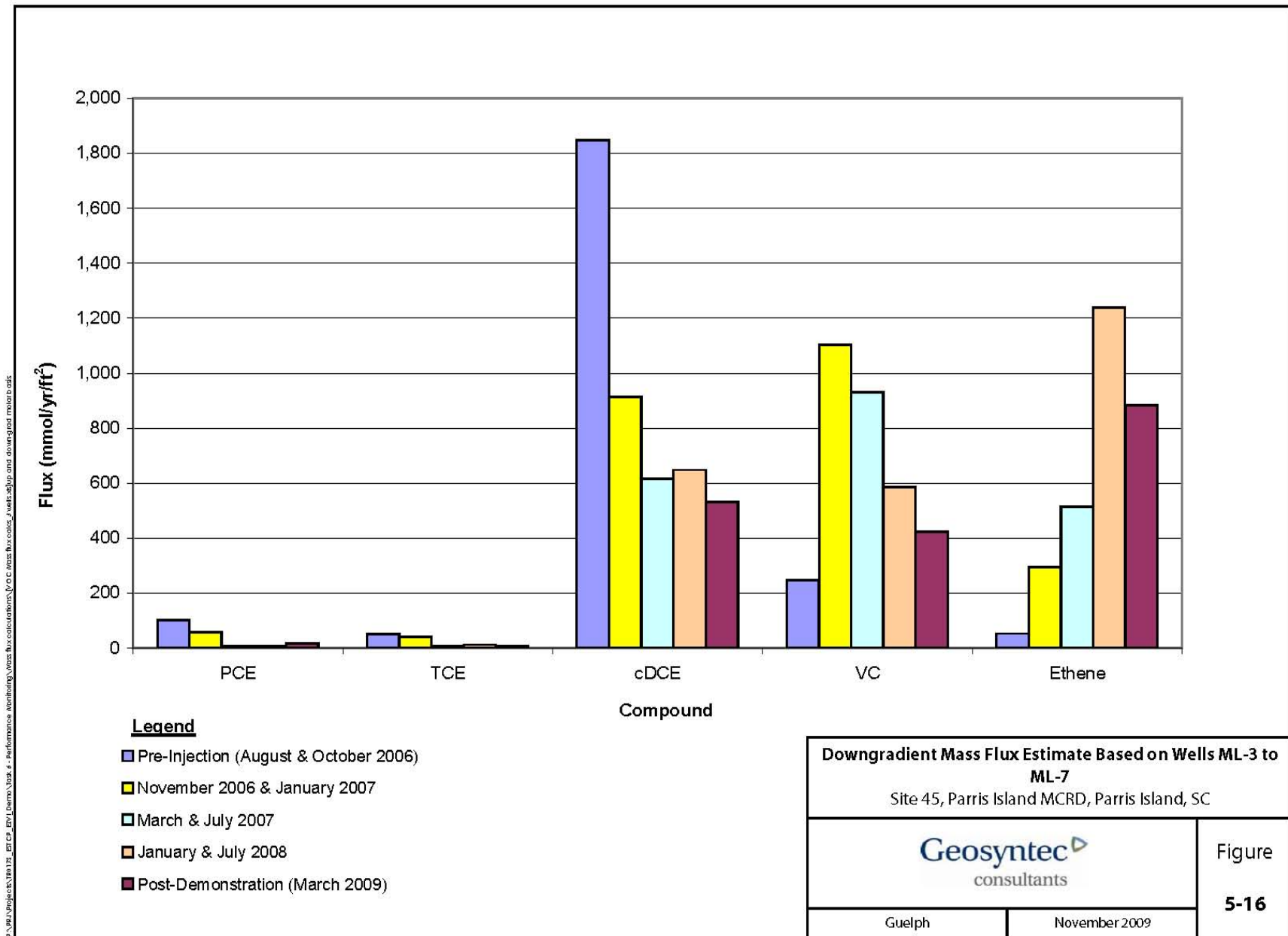
CEs - chlorinated ethenes

¹ - Wells ML-1 and ML-2

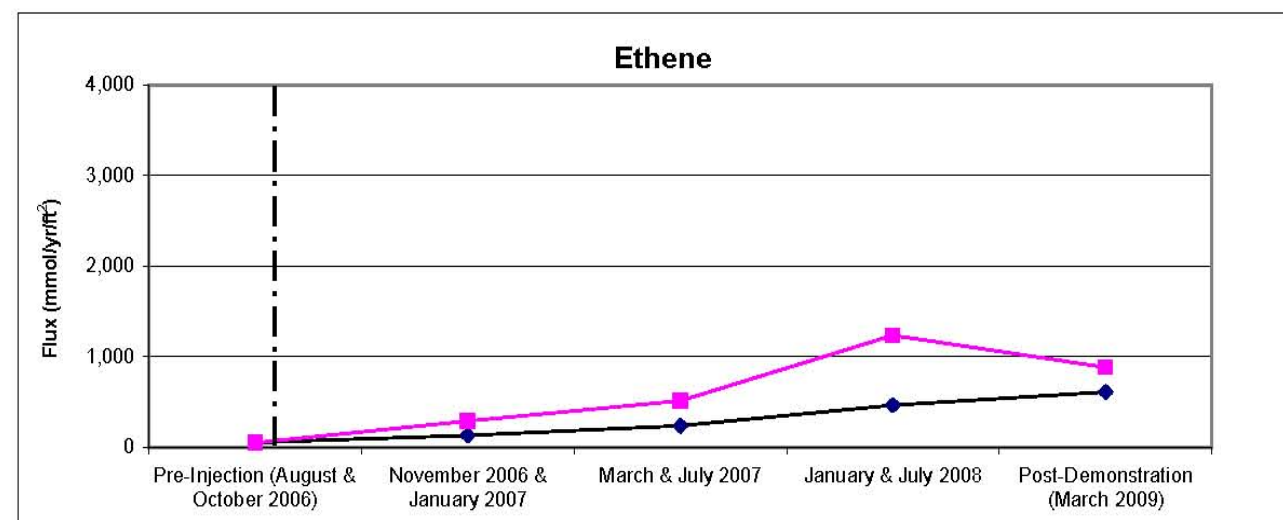
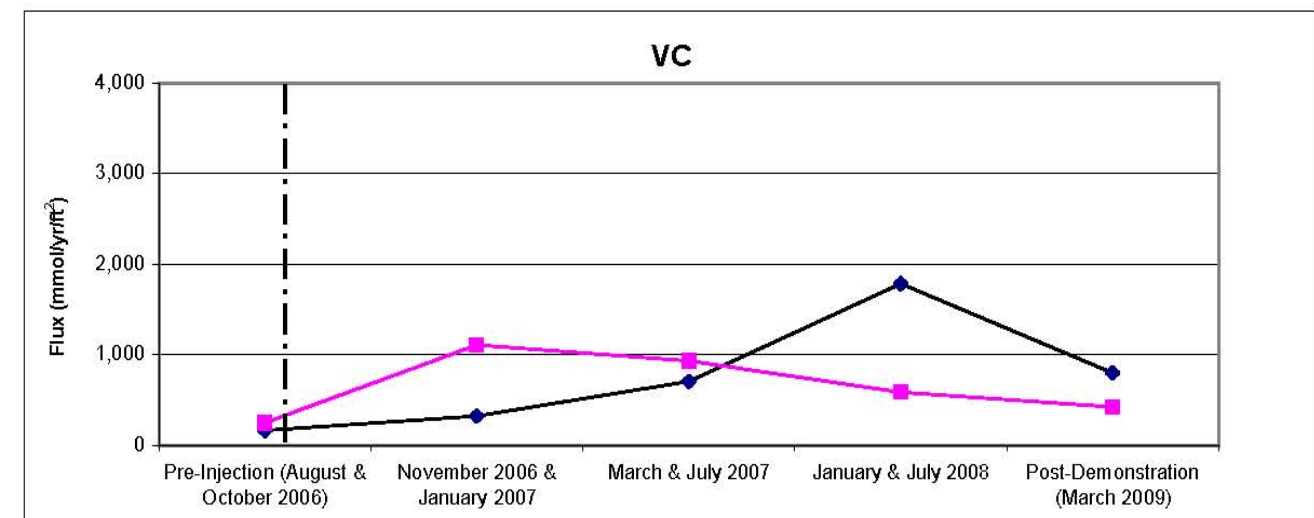
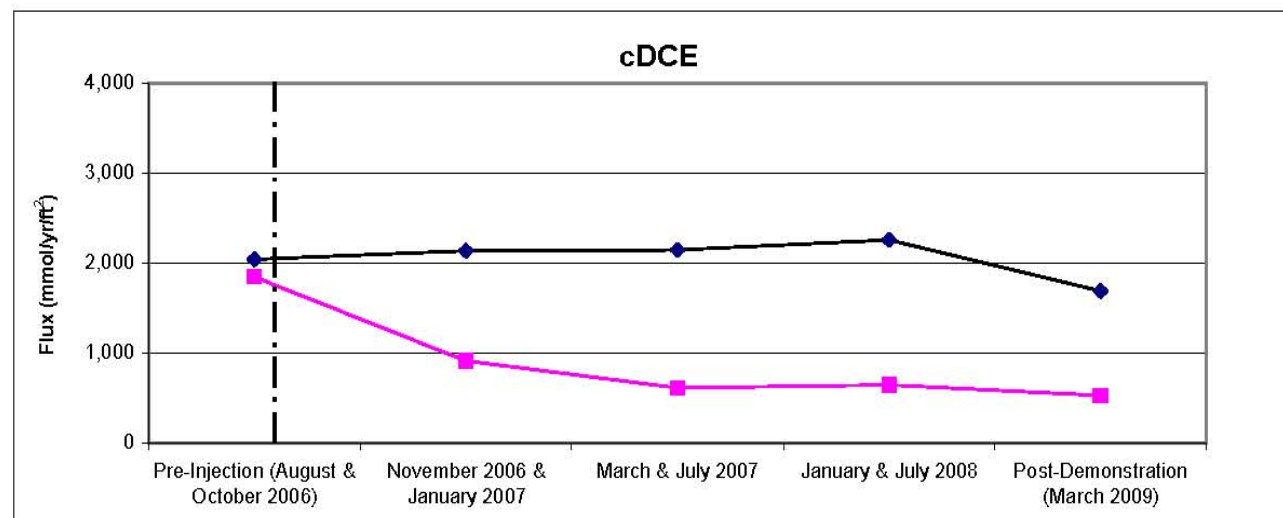
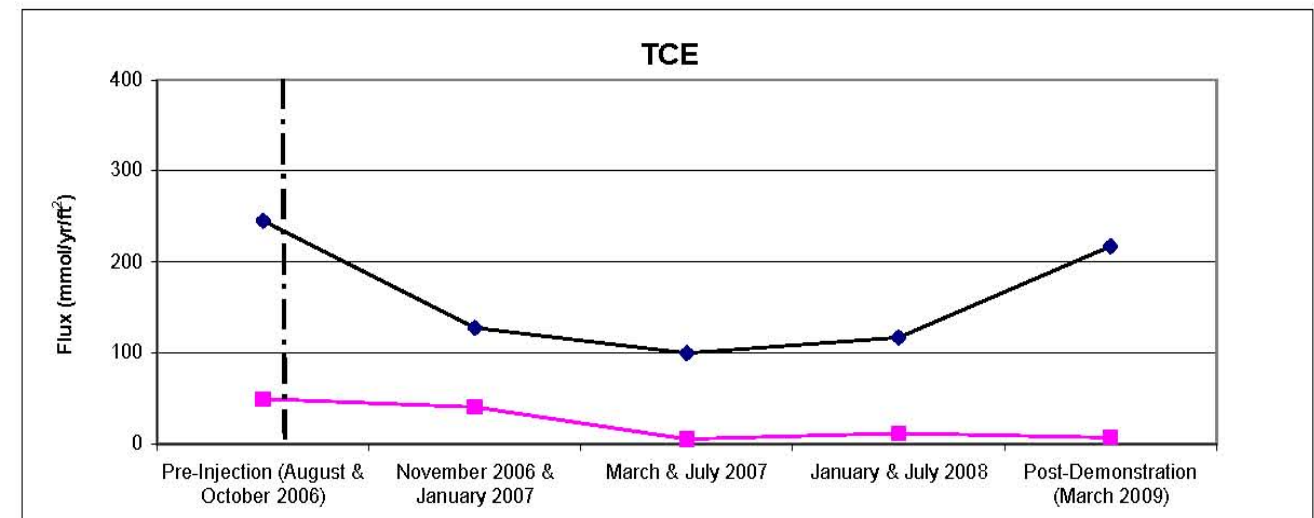
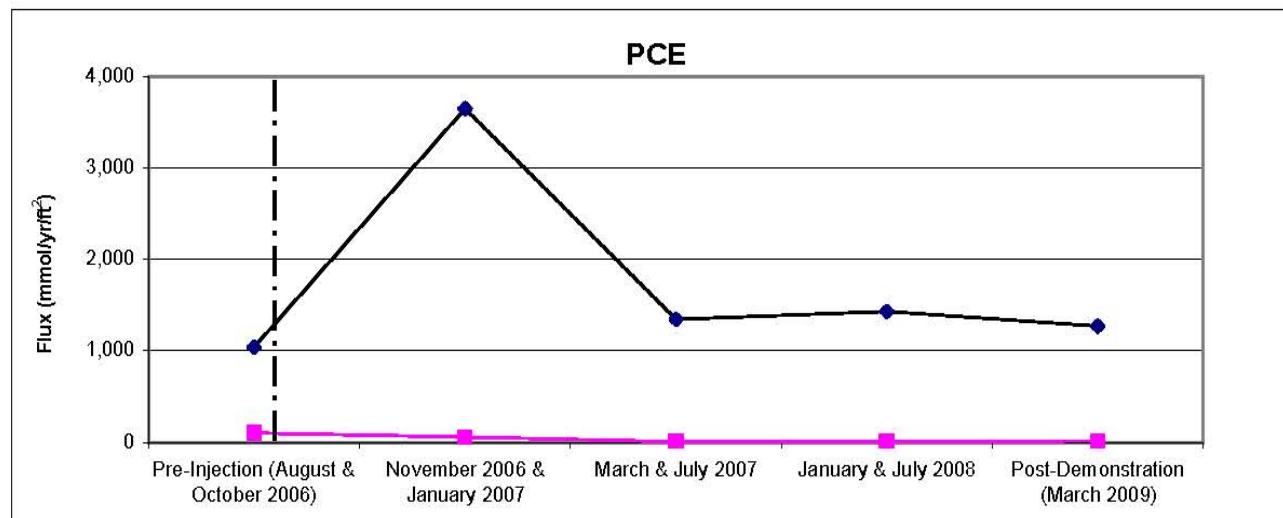
² - Wells ML-3 through ML-7

³ - Reduction in mass flux calculated using pre-injection (August & October 2006) and post-demonstration (March 2009) mass flux values. Positive value indicates a decrease in mass flux; Negative value indicate an increase in mass flux





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Legend

- ◆ Upgradient Wells (ML-1 and ML-2)
- Downgradient Wells (ML-3 to ML-7)
- EZVI Injected

Mass Flux Estimates (Upgradient and Downgradient Wells)
Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
consultants

Guelph

November 2009

Figure
5-17

not just displacement of water or DNAPL out of the plot. The VC mass flux is expected to continue to decrease and ethene mass flux is expected to continue to increase or remain steady as degradation continues.

There were elevated cDCE and VC concentrations as well as some ethene in the plot due to natural biodegradation before any EZVI was added. Based on this evidence and data collected by the Navy on the native bacterial population at the Site, it was decided that no bioaugmentation would be performed with the EZVI injections. However, it is possible that the amount of VC production would have been significantly less if bioaugmentation had been performed since biodegradation of the VC to ethene might have been accelerated with a large starting bacterial population.

Estimates of VOC and ethene mass fluxes were also calculated using results of the IPTs as described in Sections 5.6.2 and 5.6.6. Comparison of pre- and post-EZVI injection mass flux mass estimates revealed significant reductions in mass flux of the parent compounds PCE (~99% reduction) and TCE (~96% reduction), and significant increases in mass flux of the degradation products cDCE, VC and ethene (Table 5-11 and Figure 5-18). These results were compared to mass flux estimates obtained using VOC and ethene concentrations for the three central downgradient multilevel wells (ML-4, ML-5 and ML-6), as these three wells are within the capture area that was inferred for the integral pump tests. A summary of the estimated mass fluxes and percent reductions in mass fluxes using both methods is provided in Table 5-11 and are shown graphically on Figures 5-18 and 5-19. Detailed calculations are provided in Appendix E (Tables E-43 to E-47). Percent reductions in mass flux for the parent compounds PCE and TCE compare well for the two methods (IPT and 3-well downgradient transect); PCE mass flux reductions of 99% (IPTs) and 91% (3-well downgradient transect), and TCE mass flux reductions of 96% (IPTs) and 85% (3-well downgradient transect). The percent increases in VC mass flux also compare well for the two methods.. However, for all compounds the mass flux estimated from the transect wells were much higher than those measured from the IPTs. The higher mass flux estimates from the transect wells are to be expected due to the proximity of these wells to the source and the much smaller area of influence captured during sampling of these multilevel wells in comparison with PMW-3 which under pumping conditions would capture water from a larger area with lower concentrations. The cDCE mass flux calculated using the transect wells was much greater in both the pre-injection and post-demonstration data with a change from ~2,210 mmol/yr/ft² to 559 mmol/yr/ft² whereas with the IPT the values and difference were much smaller with a pre-injection mass flux of ~49 mmol/yr/ft² and a post-demonstration mass flux of ~90 mmol/yr/ft².

With the IPT and the 3-well transect mass flux calculations, evidence of increased VC and ethene mass flux from pre-injection to the post-demonstration period confirm degradation of the parent compounds.

TABLE 5-11: PNEUMATIC INJECTION PLOT IPT AND MULTILEVEL
WELL MASS FLUX ESTIMATES
Parris Island, South Carolina

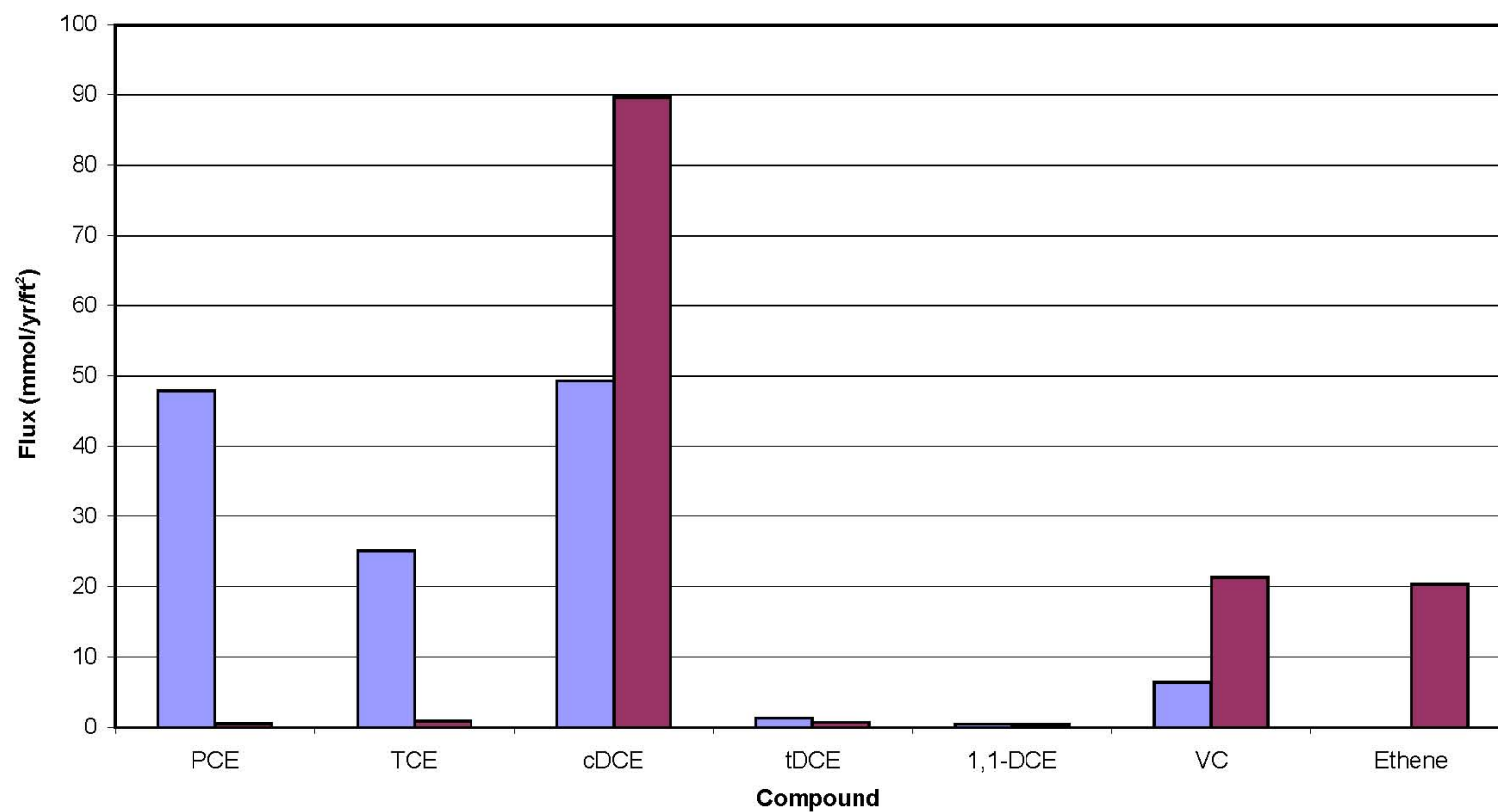
Geosyntec Consultants

	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride	Total CEs	Ethene
Integral Pump Tests						
Pre-Injection Flux (mmol/yr/ft ²)	47.9	25.1	49.3	6.3	130.4	1.1
Post-Demonstration Flux (mmol/yr/ft ²)	0.5	0.9	89.6	21.3	113.5	20.3
Change (mmol/yr/ft ²)	-47.4	-24.2	40.3	15.0	-16.9	19.2
% Reduction	99%	96%	-82%	-239%	13%	-1667%
Downgradient Multilevel Wells¹						
Pre-Injection Flux (mmol/yr/ft ²)	102.3	42.5	2,209.9	160.0	2,564.8	20.4
Post-Demonstration Flux (mmol/yr/ft ²)	9.1	6.3	559.0	484.5	1,071.0	961.0
Change (mmol/yr/ft ²) ³	-93.2	-36.1	-1650.9	324.4	-1493.8	940.6
% Reduction	91%	85%	75%	-203%	58%	-4616%

Notes:

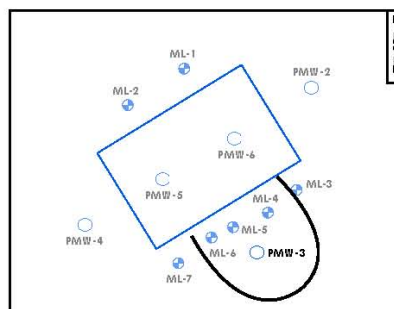
¹ - Wells ML-4, ML-5 and ML-6 as these are the three multilevel wells that are within the capture area of the integral pump test

³ - Change in mass flux calculated using pre-injection (August & October 2006) and post-demonstration (March 2009) mass flux values. Positive value indicates a decrease in mass flux; Negative value indicate an increase in mass flux
CEs - chlorinated ethenes



Legend

- Pre-Injection (August & October 2006)
- Post-Demonstration (March 2009)
- Expected PMW-3 Capture Zone



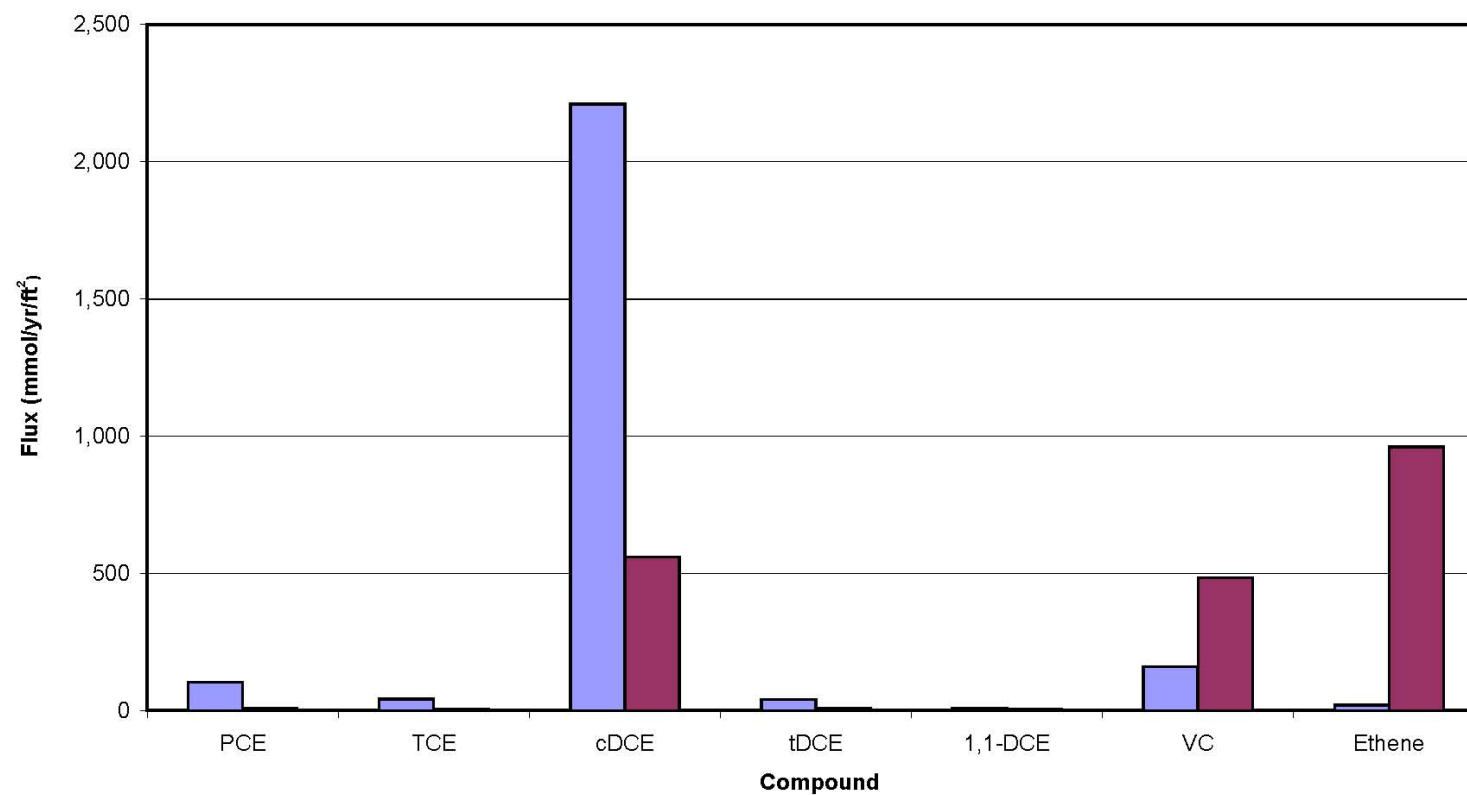
Integral Pump Test Mass Flux Estimates Site 45, Parris Island MCRD, Parris Island, SC

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Figure
5-18

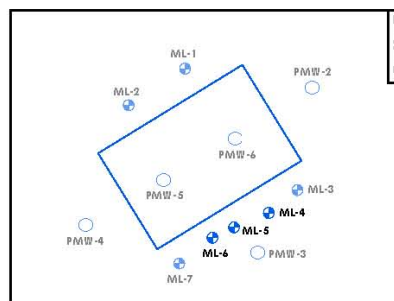
Guelph

November 2009



Legend

- Pre-Injection (August & October 2006)
- Post-Demonstration (March 2009)



**Downgradient Mass Flux Estimate Based on
Wells ML-4, ML-5 and ML-6**
Site 45, Parris Island MCRD, Parris Island, SC

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consultants

Guelph

November 2009

**Figure
5-19**

5.8.5 USEPA Research Interests and Contributions

In addition to the work performed by Geosyntec, the USEPA provided considerable support for the Dem/Val through the following contributions:

- Provided drill rig and materials for installing the monitoring wells and collecting the baseline soil cores;
- Participated in each of the groundwater sampling events;
- Collected additional groundwater geochemical data (listed below) beyond what was originally planned for in the Dem/Val; and
- Provided field analytical instruments and conducted most of the laboratory sample analyses.

During the Dem/Val, the USEPA collected more than 345 groundwater samples for analysis of TOC and total inorganic carbon (TIC), anions and dissolved metals, more than 310 groundwater samples for analysis of alkalinity, more than 125 groundwater samples for analysis of total metals, and more than 65 groundwater samples for analysis of stable isotopes. The USEPA also collected numerous soil and groundwater samples for X-ray diffraction analyses of colloids. Analytical data is provided in Appendix E. X-ray diffraction analyses was utilized to observe the mineralogical changes that may be occurring within the subsurface as a result of the EZVI injections (i.e., corrosion products such as elemental iron and minor components of magnetite). The USEPA data is presented in Appendix E: Data Collected by USEPA.

Compound-specific carbon-13 ($\delta^{13}\text{C}$) isotope results suggest that degradation of PCE and its daughter products were occurring because most of the $\delta^{13}\text{C}$ isotope values increased (less negative) over time after EZVI injection (Tables 5-12 and 5-13). The chlorine-37 isotope ($\delta^{37}\text{Cl}$) values for all the extracted chlorinated solvents from groundwater measured in March 2007 also were greater than those measured before injection, further supporting the notion that chlorinated hydrocarbons were degrading. Thus both abiotic and biotic mechanisms may be operative at the Site (Table 5-14).

X-ray diffraction results of suspended solids collected from monitoring wells during well purging showed transformation of elemental iron to magnetite (Fe_3O_4) and lepidocrocite ($\gamma\text{-FeOOH}$) in ML-3-1 and ML-3-2.

TABLE 5-12: PRE-INJECTION GROUNDWATER COMPOUND-SPECIFIC $\delta^{13}\text{C}$ ISOTOPE VALUES
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	PCE	TCE	cis-DCE	trans-DCE	1,1-DCE	VC	ethene	ethane
ML2-3	05-Oct-06	--	-26.1	-27.3±0.2	-29.3	nd	-35.2	-31.2±0.2	-29.7±0.3	-29.4
ML2-5	05-Oct-06	--	-27.6	-32.3	-32	nd	-40.5	-27.9	nd	nd
ML5-3	05-Oct-06	--	-18.8	-18.3	-28.4	nd	coel	-37.8±0.5	-29.6±0.1	-37.1
ML5-5	05-Oct-06	--	-25.8	-26.7	-29	nd	-37.1	-37.0±0.2	-28.8±0.2	nd
PMW-5	05-Oct-06	--	-27.0 ±0.2	-30.9±0.1	-28.2±0.3	nd	coel	-27.6	-30.8±0.3	-37
PMW-3	10-Oct-06	--	-27.2	-31.3	-27.6±0.2	nd	coel	-39.1	-29.1	-36
PMW-3	10-Oct-06	Field Duplicate	-27.1	-31	-27.5	nd	coel	-39.1±0.1	-29.3	-34.5

Notes:

nd - not detected

coel - coelution

Compound-specific $\delta^{13}\text{C}$ isotope values reported as mean ± standard deviation, n = 2, per ml

TABLE 5-13: MARCH 2007 GROUNDWATER COMPOUND-SPECIFIC $\delta^{13}\text{C}$ ISOTOPE VALUES
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	PCE	TCE	cis-DCE	trans-DCE	1,1-DCE	VC	ethene	ethane
ML2-3	21-Mar-07	--	-26.4±0.3	-24.6	-26.5	-40.7	coel	-36.8±0.4	-37.1±0.1	-43.3±0.1
ML2-5	22-Mar-07	--	-29	-33.1±0.1	-30.5±0.0	-41.5±0.8	-41.9	-34.9	-42.1±0.1	-52.6
ML5-3	23-Mar-07	--	-18.3±0.3	-23.6±0.0	-26.0±0.1	-36.7±0.4	-34.4±0.5	-29.0±0.1	-34.8±0.3	nd
ML5-5	23-Mar-07	--	-14	-23.7±0.4	-28.1	-40.1	-39.8	-32.5±0.4	-38.2±0.4	-46.5±0.5
PMW-5	21-Mar-07	--	-27.9	-26.8	-29.7	-38.8	-39.1	-36.0±0.2	-41.6±0.3	-47.9±0.7
PMW-5	21-Mar-07	Field Duplicate	-28.1±0.0	-26.9±0.2	-29.5±0.0	-39.7±0.5	-39.1	-35.9	-42.1±0.1	-48.0±0.1
PMW-3	21-Mar-07	--	-24.5	-25.3	-28.3	-39.4	-39.2±0.1	-36.7±0.1	-41.8±0.4	-48.0±0.1

Notes:

nd - not detected

coel - coelution

Compound-specific $\delta^{13}\text{C}$ isotope values reported as mean ± standard deviation, n = 2, per ml

**TABLE 5-14: PRE- AND POST-INJECTION LUMP-SUM
GROUNDWATER $\delta^{37}\text{Cl}$ ISOTOPE VALUES
Parris Island, South Carolina**

Location	Duplicate	Pre-Injection (October 2006)	Post-Injection (March 2007)
ML2-3	--	3.99	5.43
ML2-5	--	2.57	3.3
ML5-3	--	4.43	5.11
ML5-5	--	4.29	4.85
PMW-5	--	3.46	4.55
PMW-5 Dup	Field Duplicate	--	4.38
PMW-3	--	3.29	4.71
PMW-3 Dup	Field Duplicate	4.32	--

Notes:

-- - not collected

Data are lump-sum $\delta^{37}\text{Cl}$ isotope values for the whole extracted chlorinated solvents from groundwater before (October 2006) and after (March 2007) EZVI injection

6.0 PERFORMANCE ASSESSMENT

This section provides a summary of all data analysis in support of the assessment of performance objectives. Substantive analyses of data obtained during the demonstration that supports the conclusions summarized in Section 3 is provided. Where appropriate, references to discussions or data analysis presented in Section 5 are made rather than repeating information.

6.1 REDUCTION IN MASS FLUX OF VOCs IN DOWNGRAIENT WELLS

A key performance objective was the reduction in mass flux of dissolved VOCs in downgradient monitoring wells for areas in contact with EZVI. To evaluate this objective, groundwater samples were collected before and after EZVI injection and analyzed for VOCs. Data from the post-demonstration sampling event (March 2009) are compared to data from the pre-injection (baseline) sampling event. Data included analyses of samples from five multilevel wells and from the integral pump test. Successful performance was set as >75% decrease in mass flux of dissolved VOCs based on groundwater samples from multilevel wells over the baseline condition for areas in contact with EZVI.

This objective was met based on the significant reductions in mass flux of the parent compounds PCE (85% to 99%; based on multilevel transects and IPT respectively) and TCE (86% to 95% based on multilevel transects and IPT respectively) using the various methods of estimating mass flux (Tables 5-10 and 5-11). Reductions in cDCE, which is an intermediate degradation product of the PCE and TCE, of 71% to 75% were also observed using the multilevel transect wells (Tables 5-10 and 5-11 and Figures 5-16 and 5-19). Vinyl chloride, another intermediate degradation product of PCE and TCE, showed increases in mass flux of 71% up to 240% (multilevel and IPT respectively) but this increase is a transient effect and the cDCE and VC are degrading over time to form ethene. A significant increase in the ethene mass flux (1600% to 4600%) (Tables 5-10, 5-11, and Figures 5-15 and 5-17) was also observed indicating that the degradation of PCE and TCE are not stalling at VC but continuing to complete dechlorination. The isotope fractionation data from the EPA (Section 5.8.5, and Tables 5-12 and 5-13) supports the degradation of PCE and TCE to form the ethene observed.

There were some difficulties providing uniform distribution of the EZVI within the plot and the amount of EZVI that was injected into the plot was roughly 275 gal short of the target amount (Section 5.6.5). It is possible that if the issues with short-circuiting of EZVI to surface had not occurred and the targeted 850 gal of EZVI could have been injected into the plot, the reduction in mass flux would have been even higher.

6.2 REDUCTION IN TOTAL VOC AND DNAPL MASS

The amount of VOC and DNAPL reduction in the Pneumatic Injection test plot was assessed by comparing results of pre-injection (baseline) and post-injection groundwater and soil core samples. A successful performance was set as a >75% decrease in VOC and DNAPL mass over baseline conditions in the Pneumatic Injection test plot.

This objective was met with a total VOC mass reduction of 85% in the pneumatic injection plot (Section 5.8.4, and Table 5-9). The pre-demonstration mass estimate was ~38 kg of VOCs and the post-demonstration estimate was ~5.6 kg of VOC mass remaining in the plot. This breakdowns to an estimated reduction of 63% in the sorbed and dissolved phases and a 93% reduction in the DNAPL mass (Table 5-9). The calculations are explained further in Section 5.8.4.

Again, the issues with the injection of EZVI in the plot resulted in a significant shortfall (~275 gal) in the amount of EZVI injected. It is expected that even higher reductions in mass would have been observed had the targeted 850 gal of EZVI been successfully distributed through the plot.

6.3 RADIUS OF INFLUENCE

The radius of influence (ROI) of each injection technology was assessed through visual inspection of soil cores collected post-injection. For the Pneumatic Injection and Direct Injection test plots, the objective was the presence of EZVI at distances greater than 5 feet (ft) and 1 ft, respectively.

This objective was met with measured ROIs of 5 to 7 feet with pneumatic injection and 1 to 2.5 ft with direct injection (**Table 5-5 and Figure 5-5**). Soil cores were collected after all EZVI injections were complete to reduce the likelihood of providing short-circuit pathways through boreholes. As a result, it was not possible to determine which direction the EZVI observed in each soil boring came from. We have used the most conservative estimate by using the closest injection points as the assumed point of origin for any EZVI observed in a core. It is possible that the injection technologies move the EZVI further than 7 ft or 2.5 ft for the pneumatic and direct injection respectively.

6.4 ABILITY TO INJECT EZVI WITHOUT DAMAGING EMULSION STRUCTURE

The ability to inject EZVI without damage to the emulsion structure was evaluated by examining the EZVI under microscope in the cores collected to evaluate the distribution. For this performance criterion, success was achieved if the injection technologies be able to deliver the EZVI within the source zone without damage to the emulsion structure.

This objective was met with both technologies being able to inject the EZVI without damage to the emulsion structure. Samples of the EZVI from two cores (one from each plot) were collected and evaluated using a light microscope. Droplets of EZVI on the sand grains suspended in water were located in the samples and the emulsion structure was visually determined to be intact.

6.5 ABILITY TO EVENLY DISTRIBUTE EZVI

The ability of each injection technology to evenly distribute EZVI in a controlled manner over an optimum ROI was assessed by collecting groundwater and soil core samples from the test plots. Success was marked by the ability of the injection technology to deliver the EZVI within the source zone in a way that will allow some control of the direction of EZVI injection so as to evenly distribute the EZVI over the injection interval.

This objective was partially met. There were complications with the shallow nature of the injections and preferential flow paths created by previous borings in the area providing short circuit pathways for the EZVI to surface. There was a significant amount of fingering and a very uneven distribution of EZVI over the target treatment depth interval (**Table 5-5**). The injections in both plots were complicated by the shallow nature of the site and short-circuiting or daylighting to surface (**Table 5-4 and Figure 5-4**). It is believed that the pneumatic injection would have been capable of greater radius of influence and less fingering or preferential flow path development had the target injection interval been deeper. This would have allowed the injections to occur at higher pressures and velocities while minimizing the risk of short-circuiting to ground surface. In addition, we were only able to inject approximately 576 gal of EZVI into the pneumatic injection plot and were not able to follow planned the injection strategy (Section 5.6.5). This also limited the ability to evenly distribute the EZVI over the target depth interval since we did not have as much EZVI to distribute.

6.6 EASE OF IMPLEMENTATION

The ease of use of this technology was evaluated based on the experience of field staff and the costs of the manufacturing of the EZVI and the injection of EZVI. The success criterion for this objective is that the EZVI manufacturing and injection can be readily accomplished using standard industry procedures and contractors.

This objective was achieved based on experience with the actual manufacturing and injection of EZVI at the Site. The equipment required for the manufacturing of EZVI on Site was readily available through the food manufacturing industry (industrial mayonnaise mixer) and the option to purchase EZVI manufactured by vendors and shipped to the Site ready for injection also exists. The injection equipment used to injection the EZVI was all readily available through local drillers, pneumatic injection companies and plumbing suppliers. The procedures used to manufacture the EZVI were well established procedures and were simple enough to be conducted by field technicians with training in the manufacturing techniques. The procedures used to inject the EZVI were standard and well established procedures for local drillers (direct injection) and pneumatic injection contractors and the procedures were simple enough to be conducted by field technicians with training in basic injection techniques and handling techniques of the EZVI.

Although there were difficulties with short-circuiting of the EZVI to surface during injection this was believed to be site-specific with the shallow nature of the target treatment interval and the presence of pre-existing short-circuit pathways (old boreholes).

6.7 VERSATILITY

For this performance criterion, the technology was deemed successful if it could be applied in a variety of geological and hydrogeological settings where DNAPL source areas are present.

This objective was met although there are some restrictions on the depth in which the injection technologies tested can be applied. As long as the direct push injection and pneumatic injection equipment can be deployed in a geologic media there should be no restriction to injection of EZVI using this equipment in these formations. Both injection technologies have been applied in many geological and hydrogeological settings including sandy and clay formations and fractured rock formation (injections through drilled boreholes or wells). If using pneumatic injection there are some restrictions on how shallow the application can be. If the injections were to occur underneath a building that would provide an overburden pressure that would limit the risk of daylighting of the injection fluid, then the injections could occur within a few feet in depth from the base of the foundation. However, in an open area it is recommended that pneumatic injection be limited to applications greater than 10 feet below ground surface to minimize the risk of daylighting and increase the control of the injections.

If coring, drilling or other disruptions to the subsurface due to activities such as site characterization has been conducted at a particular site, care must be taken in the plugging or abandoning of these holes and in the locating of the injection points to minimize the formation of preferential flow pathways and daylighting of EZVI to surface.

7.0 COST ASSESSMENT

This section presents the results of a cost assessment to implement remediation of a DNAPL source area using EZVI. Section 7.1 describes a cost model that was developed for the application of EZVI with a comparison to treatment using *in situ* chemical oxidation (ISCO) and a conventional P&T system; Section 7.2 presents an assessment of the cost drivers for the application of the technology; and Section 7.3 presents the results of an analysis of the cost model.

7.1 COST MODEL

A cost model was developed to assist remediation professionals in understanding costs associated with the EZVI technology. The cost model identified the major cost elements required to implement the EZVI technology at a typical site with a PCE or TCE DNAPL source area. A summary of the actual costs for pilot-scale implementation of the EZVI technology at Site 45, Parris Island MCRD is presented in Table 7-1.

The cost model was developed for a template site with a PCE DNAPL source area. The specific site characteristics are similar to those observed at the test site used in the technology Dem/Val at Site 45, Parris Island MCRD, and are presented in Table 7-2. Cost estimates for the EZVI technology were prepared for both pneumatic and direct injection technologies using EZVI made with either nZVI or micro-scale ZVI (mZVI) in order to provide a comparison between two types of ZVI. Cost estimates were also prepared for treatment using ISCO and for a conventional P&T system to provide a comparison with the EZVI technology. Using the template site conditions, estimates of costs for the capital, O&M, and long-term monitoring were developed for each alternative. Capital costs included design and permitting activities, mobilization, site preparation, well installation, EZVI, chemical reagents, and injection equipment. O&M costs included mobilization, equipment replacement and supplies. Long-term monitoring costs included field supplies, sampling equipment, laboratory analysis and regulatory reporting. Labor associated with the planning, procurement and implementation of all aspects of the remedies are also included. Specifically excluded from consideration are the costs of pre-remediation investigations (e.g., source area and plume delineation, risk determination, and related needs), treatability studies, and post-remediation decommissioning. Also excluded are costs for waste (e.g., soil cuttings and well development water) characterization and disposal.

While most of the identified cost elements are applicable to other remediation technologies, the EZVI material used in the technology Dem/Val at Site 45, Parris Island MCRD is unique to the technology. The volume of EZVI required is a function of the size of the treatment area and the mass of DNAPL present; so a larger treatment area and more mass will require a larger volume of EZVI. The type of ZVI used will also impact capital costs of the technology; alternate ZVI material, such as mZVI, can reduce capital costs significantly.

To obtain a clearer picture of life-cycle costs for the various treatment alternatives, cost estimates include the Net Present Value (NPV) of future costs. The NPV calculations provide

**TABLE 7-1: ACTUAL COSTS FOR EZVI TECHNOLOGY DEM/VAL
AT SITE 45, PARRIS ISLAND MCRD
Parris Island, South Carolina**

Geosyntec Consultants

Cost Element	Data Tracked During the Demonstration	Cost ¹	
Capital Costs			
Design & Planning	- Personnel required and associated labor	Labor	\$38,300
		Expense	\$900
Well Installation	- Personnel required and associated labor	Labor	\$25,400
	- Mobilization costs	Expense	\$16,300
	- Drilling contractor cost		
EZVI Injections (Pneumatic Injection)	- Personnel required and associated labor for EZVI injection activities	Labor	\$14,400
	- Mobilization costs	Expense	\$91,200
	- Costs for EZVI and injection equipment		
	- Personnel required and associated labor for EZVI injection activities	Labor	\$9,600
	- Mobilization costs	Expense	\$22,800
EZVI Injections (Direct Injection)	- Costs for EZVI and injection equipment		
Performance Monitoring Costs			
Baseline Characterization	- Personnel required and associated labor	Labor	\$40,300
	- Mobilization costs	Expense	\$21,500
	- Supplies and equipment for groundwater and soil sampling		
	- Sample shipment and laboratory analytical costs		
	- Labor associated with data reporting		
Performance Monitoring	- Personnel required and associated labor	Labor	\$179,200
	- Mobilization costs	Expense	\$99,800
	- Supplies and equipment for groundwater and soil sampling		
	- Sample shipment and laboratory analytical costs		
	- Labor associated with data reporting		

Notes:

¹ - Cost does not include Labor and Expenses for well installation and additional monitoring incurred by USEPA

TABLE 7-2: DESIGN BASIS FOR TEMPLATE SITE
Parris Island, South Carolina

Geosyntec Consultants

Design Parameters	Unit	Quantity
<i>Target Treatment Area Dimensions & Hydrogeology</i>		
Total Depth	ft bgs	20
	m bgs	6.1
Depth to Water	ft bgs	4
	m bgs	1.2
Saturated Thickness	ft	16
	m	4.9
Source Area Width	ft	40
	m	12.2
Source Area Length	ft	150
	m	45.7
Effective Porosity	v/v	0.3
Hydraulic Conductivity	ft/yr	71
	m/yr	21.7
Horizontal Gradient	ft/ft	0.0026
Seepage Velocity	ft/yr	0.62
	m/yr	0.2
Source Area Bulk Volume	ft ³	96,000
	m ³	2,718
Bulk Density (Dry)	kg/ft ³	51
	kg/m ³	1,800
Source Area Soil Mass	kg	4,893,151
Source Area Pore Volume	ft ³	28,800
	m ³	816
	gal	215,439
<i>Source Area Contamination</i>		
Total Mass of PCE in Source Area	kg	1294.6
Total Mass of TCE in Source Area	kg	63.4
Total Mass of cDCE in Source Area	kg	73.7
Total Mass of VC in Source Area	kg	89.0
Total Mass of VOCs in Source Area	kg	1,520.7
<i>EZVI - Pneumatic Injection</i>		
Number of Injection Points		20
Injection Point ROI	ft	10
	m	3
Volume of EZVI (% of Source Area Pore Volume)		15%
	gal	32,316
Number of Monitoring Wells		4
<i>EZVI - Direct Injection</i>		
Number of Injection Points		240
Injection Point ROI	ft	10
	m	3
Volume of EZVI (% of Source Area Pore Volume)		15%
	gal	32,316
Number of Monitoring Wells		4

TABLE 7-2: DESIGN BASIS FOR TEMPLATE SITE
Parris Island, South Carolina

Geosyntec Consultants

Design Parameters	Unit	Quantity
<i>In Situ Chemical Oxidation</i>		
Natural Oxidant Demand	g NaMnO ₄ /kg soil	1.5
Required Mass of NaMnO ₄	kg	10,045
Number of Extraction Wells		1
Total Extraction Rate	gpm	2
	Lpm	7.6
Number of Injection Wells		2
Number of Monitoring Wells		4
<i>Pump and Treat</i>		
Groundwater PCE Concentration	mg/L	22
Groundwater TCE Concentration	mg/L	6
Groundwater cDCE Concentration	mg/L	44
Groundwater VC Concentration	mg/L	3
Number of Extraction Wells		2
Total Extraction Rate	gpm	2
	Lpm	7.6
<i>Treatment Duration</i>		
Duration of EZVI Injection - Pneumatic	days	13
Duration of EZVI Injection - Direct	days	31
Duration of Post-EZVI Injection Monitoring	years	10
Duration of ISCO Implementation	years	3
Duration of Post-ISCO Monitoring	years	10
Duration of Pump and Treat	years	30
Discount Rate	%	2.7

Notes:

ft bgs - feet below ground surface
m bgs - meters below ground surface
ft - feet
m - meters
v - volume
ft/yr - feet per year
m/yr - meters per year
ft³ - cubic feet
m³ - cubic meters
kg/ft³ - kilograms per cubic foot
kg/m³ - kilograms per cubic meter
gal - gallon
kg - kilograms
g - grams
gpm - gallons per minute
Lpm - liters per minute
ft/d - feet per day
% - percent

cash flow analysis for 30 years, showing the costs by category for each year. The future costs are only carried forward for 30 years on the basis that the NPV of future costs beyond the 30-year time frame are small and the future costs beyond the 30-year period of time are difficult to predict. O&M and long-term monitoring costs are discounted at a rate of 2.7% based on the real discount rate provided by the U.S. Federal Government Office of Management and Budget for 30-year notes and bonds (Office of Management and Budget, 2008).

The template site assumes a homogenous silty sand aquifer to a depth of 20 ft bgs with a hydraulic conductivity of 71 ft/year, a horizontal gradient of 0.0026 ft/ft and an effective porosity of 0.3. These aquifer characteristics result in a groundwater seepage velocity of approximately 0.62 ft/year. Depth to water is 4 ft bgs. The source area measures 40 ft in width by 150 ft in length. The total estimated mass of VOCs in the source area is approximately 1,521 kg. Maximum concentrations of PCE, TCE, cDCE and VC at the downgradient edge of the source area are 22 mg/L, 6 mg/L, 44 mg/L, and 3 mg/L, respectively.

For the EZVI injection alternatives, the EZVI used is the same formulation as that used in the technology Dem/Val at Site 45, Parris Island MCRD, and will be manufactured on-site. However, during full-scale implementation where large volumes of EZVI are required it may be more practical to source a bulk supplier of EZVI such as Toxicological & Environmental Associates, Inc. (Baton Rouge, LA), who are a bulk supplier of EZVI consisting of a blend of nZVI and mZVI particles (0.2 to 3 μm size range). The costs to manufacture the EZVI using nZVI on-site from purchased components is essentially the same as purchasing the bulk-supplied material, so the costs presented later in the section are applicable to either option.

The EZVI application using pneumatic injection assumes EZVI will be injected into twenty injection points (each injection point having an ROI of 10 ft) in the source area. The impact of the EZVI injections will be monitored using four downgradient 2-inch monitoring wells screened within the saturated zone. The injection strategy is to inject EZVI using 2 ft vertical lifts between 4 and 20 ft bgs. EZVI will first be injected around the perimeter of the source area (each a 180° injection inwards), pushing the EZVI and potentially mobile DNAPL toward the center of the source area, followed by injections of EZVI along the centerline of the source area (each injection point consisting of a total of 360° injection, comprised of four 90° injections at each depth) to help promote mixing of the DNAPL and EZVI as the EZVI is pushed back toward the edges of the source area. The volume of EZVI to be injected is based on 15% of the source area pore volume. The downgradient monitoring wells will be sampled on a quarterly basis for a period of 10 years following EZVI injection activities to assess the effect of source area treatment and natural attenuation of the VOC plume.

The EZVI application using direct injection assumes EZVI will be injected into two-hundred and forty injection points (each injection point having an ROI of 2.5 ft) in the source area. The impact of the EZVI injections will be monitored using four downgradient 2-inch monitoring wells screened within the saturated zone. The injection strategy is to inject EZVI using 1-ft vertical lifts between 4 and 20 ft bgs. The injection points will be spaced to cover the entire

source area. The volume of EZVI to be injected is based on 15% of the source area pore volume. The downgradient monitoring wells will be sampled on a quarterly basis for a period of 10 years following EZVI injection activities to assess the effect of source area treatment and natural attenuation of the VOC plume.

To facilitate the cost analysis, it was assumed that a single injection event for both the Pneumatic and Direct Injection alternatives is required. Furthermore, it was assumed that pre-existing investigation borings are not present or have been decommissioned using grout and that daylighting of EZVI is not a concern.

The ISCO approach assumes construction of a recirculation system to facilitate distribution of oxidant within the source area. The ISCO recirculation system will consist of one groundwater extraction well positioned downgradient of the source area and two upgradient injection wells. The impact of the ISCO system will be monitored using four downgradient 2-inch monitoring wells. All wells will be screened within the saturated zone. The extraction well will be equipped with an electrically-operated submersible pump. The maximum total groundwater extraction rate is assumed to be 2 gpm. Extracted groundwater will be amended with sodium permanganate and re-injected via the injection wells. The total mass of permanganate, which is based upon providing sufficient permanganate to meet the demand exerted by both uncontaminated soil (assumed to be 1.5 grams [g] of sodium permanganate [NaMnO₄] per kg of soil) and VOCs (1.1 milligram [mg] NaMnO₄/mg PCE, 2.2 mg NaMnO₄/mg TCE, 3.9 mg NaMnO₄/mg cDCE, and 7.6 mg NaMnO₄/mg VC; ITRC, 2005), is 10,045 kg. It is assumed that three years of system operation are required; each year consists of 3 weeks of recirculation with permanganate injection followed by 4 weeks of recirculation without permanganate injection. The downgradient monitoring wells will be sampled on a quarterly basis for a period of 10 years following final year of ISCO operational activities to assess the effect of source area treatment and natural attenuation of the VOC plume.

The P&T system assumed for this cost analysis will consist of two groundwater extraction wells screened within the saturated zone and equipped with electrically-operated submersible pumps. The maximum total groundwater extraction rate is assumed to be 2 gpm. Extracted groundwater will be treated using an air stripping tower. The vapor stream from the air stripping tower will be treated using granular activated carbon, and treated groundwater will be recharged into the shallow aquifer via an infiltration gallery. The treated groundwater effluent and the vapor stream from the activated carbon will be sampled on a weekly basis for a period of 30 years to assess system performance.

7.2 COST DRIVERS

The costs to implement the EZVI technology for source area remediation will vary significantly from site to site. The key costs drivers are listed below, along with a brief discussion of their impact on cost.

Nature and Extent of Contamination

- **DNAPL mass and distribution** – A greater area of DNAPL distribution will require more injection points and more EZVI, thus increasing the capital costs of the technology.
- **Depth to source area** – Costs for the injection of EZVI and for the installation of monitoring wells will increase as the depth to the target treatment zone increases, but other costs, such as EZVI costs, will remain similar.

Aquifer Geochemistry

- **Concentration of other organic and inorganic constituents** - For the biological component of degradation, dehalorespiration of PCE/TCE can be inhibited in the presence of chloroform and 1,1,1-trichloroethane (1,1,1-TCA) (Duhamel et al. 2002). However, one advantage of the EZVI technology over conventional EISB is the ability of the ZVI to degrade other organic contaminants that are resistant to or inhibit biodegradation. Large amounts of inorganic constituents may react with the ZVI, thus consuming some of the capacity of the EZVI.
- **Groundwater pH** - For the biological component of degradation, biological activity is sensitive to pH, and the optimal pH range for dehalorespiration of PCE/TCE is ~7 to 8 (Middeldorp et al. 1999). Thus rates of biodegradation are likely to be inhibited at a pH outside of this range.

Aquifer Geology and Hydrogeology

- **Hydraulic conductivity** - EZVI may be more readily distributed in more permeable media. Application of the EZVI technology at sites with a low hydraulic conductivity (K) will generally be more expensive because a greater number of injection points are required to treat a given area.
- **Geological heterogeneity** - High heterogeneity limits the uniform distribution of EZVI within the target treatment area. Thus, treatment of sites with high heterogeneity will generally be more expensive as they may require a greater number of injection points or longer timeframes for remediation.

Available Infrastructure & Site Access

- **Available infrastructure** - The availability of existing infrastructure (e.g., existing groundwater injection or monitoring wells, storage buildings, and utilities) can reduce the cost of technology implementation.

- **Site Access** - Sites having limited access for equipment and personnel (e.g., difficult terrain, overhead obstructions, or treatment beneath a building) may incur higher costs when implementing the technology.

7.3 COST ANALYSIS

Summaries of the costs for each alternative are provided in Tables 7-3 to 7-7. The capital costs for the EZVI alternatives using pneumatic injection, which include installation of monitoring wells, the EZVI, and injection equipment, are approximately \$1,013K (nZVI) and \$672K (mZVI). The capital costs for the EZVI alternatives using direct injection are approximately \$1,014K (nZVI) and \$672K (mZVI). The annual long-term monitoring cost is estimated to be \$25K per year for all EZVI injection alternatives, and represents a NPV of \$263K over a 10-year monitoring period. The capital cost for the ISCO alternative is \$418K, which is significantly lower than the capital costs for the EZVI using nZVI alternatives, and moderately lower than the capital costs for the EZVI using mZVI alternatives. However, the annual cost for O&M and performance monitoring during the second and third years is \$239K, and the annual long-term monitoring cost for the remaining years is \$25K. The NPVs of O&M and long-term monitoring for the ISCO alternative are \$402K and \$329K, respectively. The capital cost for the P&T alternative is \$380K, which is significantly lower than the capital costs for the EZVI and ISCO alternatives. However, the annual long-term monitoring cost of \$49K per year is higher than those of the EZVI and ISCO alternatives. The P&T alternative also has an annual O&M cost of \$57K over a 30-year period. The NPVs of O&M and long-term monitoring for the P&T alternative are \$1,202K and \$1,030K, respectively. Figure 7-1 provides a comparison of the NPV capital, O&M and long-term monitoring costs for each alternative.

The bulk volume of the source area for this scenario is 96,000 ft³ (2,718 m³). Therefore, the NPV of total remedy costs for the EZVI alternatives using nZVI and mZVI are approximately \$13.30/ft³ (\$470/m³) and \$9.74/ft³ (\$343/m³), respectively. The NPV of total remedy costs for the ISCO and P&T alternatives are \$11.96/ft³ (\$423/m³) and \$27.21/ft³ (\$961/m³), respectively.

Costs for all of the alternatives considered in this evaluation are presented in Table 7-7. Figure 7-2 shows the cumulative costs by year for each of the alternatives evaluated above. The total remedy costs for the two EZVI injection alternatives (pneumatic and direct injection) where nZVI is used are virtually the same at \$1,309,000. The costs for the EZVI injection alternatives (pneumatic and direct injection) where mZVI is used are lower at about \$967,000. The costs for the ISCO alternative falls between the EZVI injection alternatives where mZVI and nZVI are used at about \$1,220,000. The costs for the P&T alternative are over \$3,500,000.

TABLE 7-3: COST FOR PNEUMATIC INJECTION EZVI ALTERNATIVE
Parris Island, South Carolina

Geosyntec Consultants

	Unit	Unit Cost	Quantity	Cost (\$)	
				nZVI	mZVI
CAPITAL COSTS					
Monitoring Well Drilling					
- Four (4) 2-inch monitoring wells, installed to 20'. Mobilization, per diem, decontamination, drums included	ea	\$1,626	4	\$6,505	\$6,505
- Drilling oversight (Staff Professional)	hr	\$85	9	\$765	\$765
- Travel, per diem	LS			\$1,120	\$1,120
EZVI Injection					
- Planning and procurement (Professional)	hr	\$110	100	\$11,000	\$11,000
- Twenty (20) injection points. Mobilization, per diem included	LS			\$66,115	\$66,115
- EZVI (nZVI)	gal	\$23	32,316	\$744,979	-
- EZVI (mZVI)	gal	\$14	32,316	-	\$460,386
- EZVI injection oversight (Staff Professional)	hr	\$85	130	\$11,050	\$11,050
- Travel, per diem	LS			\$2,880	\$2,880
TOTAL CAPITAL COSTS				\$844,414	\$559,821
TOTAL CAPITAL COSTS (INCL. 20% CONTINGENCY)				\$1,013,297	\$671,785
ANNUAL LONG-TERM MONITORING COSTS (YEARS 1 TO 10)					
Annual Monitoring					
- Performance monitoring (including sampling and analysis)	sample	\$400	24	\$9,600	\$9,600
- Reporting	LS			\$15,000	\$15,000
ANNUAL TOTAL LONG-TERM MONITORING COSTS				\$24,600	\$24,600
ANNUAL TOTAL LONG-TERM MONITORING COSTS (INCL. 20% CONTINGENCY)				\$29,520	\$29,520
NPV OF LONG-TERM MONITORING COSTS (INCL. 20% CONTINGENCY)				\$262,597	\$262,597
TOTAL NPV COST (INCL. 20% CONTINGENCY)				\$1,275,894	\$934,382

Notes:

ea - each

hr - hour

LS - lump sum

gal - gallon

**TABLE 7-4: COST FOR DIRECT INJECTION EZVI ALTERNATIVE
Parris Island, South Carolina**

Geosyntec Consultants

	Unit	Unit Cost	Quantity	Cost (\$)	
				nZVI	mZVI
CAPITAL COSTS					
Monitoring Well Drilling					
- Four (4) 2-inch monitoring wells, installed to 20'. Mobilization, per diem, decontamination, drums included	ea	\$1,626	4	\$6,505	\$6,505
- Drilling oversight (Staff Professional)	hr	\$85	9	\$765	\$765
- Travel, per diem	LS			\$1,120	\$1,120
EZVI Injection					
- Planning and procurement (Professional)	hr	\$110	100	\$11,000	\$11,000
- Two-hundred and forty (240) injection points. Mobilization, per diem included	LS			\$48,500	\$48,500
- EZVI (nZVI)	gal	\$23	32,316	\$744,979	-
- EZVI (mZVI)	gal	\$14	32,316	-	\$460,386
- EZVI injection oversight (Staff Professional)	hr	\$85	310	\$26,350	\$26,350
- Travel, per diem	LS			\$5,760	\$5,760
TOTAL CAPITAL COSTS				\$844,979	\$560,386
TOTAL CAPITAL COSTS (INCL. 20% CONTINGENCY)				\$1,013,975	\$672,463
ANNUAL LONG-TERM MONITORING COSTS (YEARS 1 TO 10)					
Annual Monitoring					
- Performance monitoring (including sampling and analysis)	sample	\$400	24	\$9,600	\$9,600
- Reporting	LS			\$15,000	\$15,000
ANNUAL TOTAL LONG-TERM MONITORING COSTS				\$24,600	\$24,600
ANNUAL TOTAL LONG-TERM MONITORING COSTS (INCL. 20% CONTINGENCY)				\$29,520	\$29,520
NPV OF LONG-TERM MONITORING COSTS (INCL. 20% CONTINGENCY)				\$262,597	\$262,597
TOTAL NPV COST (INCL. 20% CONTINGENCY)				\$1,276,572	\$935,060

Notes:

ea - each

hr - hour

LS - lump sum

gal - gallon

TABLE 7-5: COST FOR ISCO ALTERNATIVE
Parris Island, South Carolina

Geosyntec Consultants

	Unit	Unit Cost	Quantity	Cost (\$)
CAPITAL COSTS				
Well Drilling				
- Installation of one (1) 4-inch extraction well, two (2) 4-inch injection wells, and four (4) 2-inch monitoring wells, installed to 20'. Mobilization, per diem, decontamination, drums included	ea	\$2,463	7	\$17,242
- Drilling oversight (Staff Professional)	hr	\$85	27	\$2,295
- Travel, per diem	LS			\$1,280
Recirculation System Construction and Startup				
- Design, planning and procurement (Professional)	hr	\$110	200	\$22,000
- Piping, instrumentation and process control equipment	LS			\$102,700
- Construction supervision/oversight (Staff Professional)	hr	\$85	225	\$19,125
- Startup testing (Staff Professional, Technician)	hr	\$140	27	\$3,780
- Travel, per diem	LS			\$5,280
Permanganate Injection (Year 1)				
- Permanganate (as 40% NaMnO ₄ solution)	kg	\$5.67	25,113	\$142,287
- Process monitoring and maintenance (Technician)	hr	\$55	584	\$32,120
TOTAL CAPITAL COSTS				\$348,109
TOTAL CAPITAL COSTS (INCL. 20% CONTINGENCY)				\$417,731
ANNUAL O&M COSTS (YEARS 2 & 3)				
Permanganate Injection				
- Permanganate (as 40% NaMnO ₄ solution)	kg	\$5.67	25,113	\$142,287
- Process monitoring and maintenance (Technician)	hr	\$55	584	\$32,120
ANNUAL O&M COSTS				\$174,407
ANNUAL O&M COSTS (INCL. 20% CONTINGENCY)				\$209,289
NPV OF O&M COSTS (INCL. 20% CONTINGENCY)				\$402,216
ANNUAL LONG-TERM MONITORING COSTS (YEARS 1 TO 13)				
Annual Monitoring				
- Performance monitoring (including sampling and analysis)	sample	\$400	24	\$9,600
- Reporting	LS			\$15,000
ANNUAL TOTAL LONG-TERM MONITORING COSTS				\$24,600
ANNUAL TOTAL LONG-TERM MONITORING COSTS (INCL. 20% CONTINGENCY)				\$29,520
NPV OF LONG-TERM MONITORING COSTS (INCL. 20% CONTINGENCY)				\$328,664
TOTAL NPV COST (INCL. 20% CONTINGENCY)				\$1,148,610

Notes:

ea - each

hr - hour

LS - lump sum

kg - kilogram

TABLE 7-6: COST FOR PUMP AND TREAT ALTERNATIVE
Parris Island, South Carolina

Geosyntec Consultants

Task Description	Unit	Unit Cost	Quantity	Cost (\$)
CAPITAL COSTS				
Well Drilling				
- Installation of two (2) 4-inch extraction wells, installed to 20'. Mobilization, per diem, decontamination, drums included	ea	\$3,155	2	\$6,310
- Drilling oversight (Staff Professional)	hr	\$85	18	\$1,530
- Travel, per diem	LS			\$1,280
Treatment System Construction and Startup				
- Design, planning and procurement (Professional)	hr	\$110	275	\$30,250
- Air stripping tower and vapour phase carbon vessels	LS			\$60,000
- Piping, instrumentation and process control equipment	LS			\$116,900
- Infiltration gallery	LS			\$67,900
- Construction supervision/oversight (Staff Professional)	hr	\$85	270	\$22,950
- Startup testing (Staff Professional, Technician)	hr	\$140	27	\$3,780
- Travel, per diem	LS			\$6,080
TOTAL CAPITAL COSTS				\$316,980
TOTAL CAPITAL COSTS (INCL. 20% CONTINGENCY)				\$380,376
ANNUAL O&M COSTS (YEARS 1 TO 30)				
- Process monitoring and maintenance (Technician)	hr	\$55	416	\$22,880
- Equipment and replacement parts and other direct costs	LS			\$16,000
- Carbon vessel changeout	LS			\$9,000
ANNUAL O&M COSTS				\$47,880
ANNUAL O&M COSTS (INCL. 20% CONTINGENCY)				\$57,456
NPV OF O&M COSTS (INCL. 20% CONTINGENCY)				\$1,202,475
ANNUAL LONG-TERM MONITORING COSTS (YEARS 1 TO 30)				
Annual Monitoring				
- Performance monitoring (including sampling and analysis)	sample	\$250	104	\$26,000
- Reporting	LS			\$15,000
ANNUAL TOTAL LONG-TERM MONITORING COSTS				\$41,000
ANNUAL TOTAL LONG-TERM MONITORING COSTS (INCL. 20% CONTINGENCY)				\$49,200
NPV OF LONG-TERM MONITORING COSTS (INCL. 20% CONTINGENCY)				\$1,029,688
TOTAL NPV COST (INCL. 20% CONTINGENCY)				\$2,612,539

Notes:

ea - each

hr - hour

LS - lump sum

TABLE 7-7: SUMMARY OF COSTS FOR TREATMENT OF PCE DNAPL SOURCE AREA
Parris Island, South Carolina

Genosyntec Consultants

Alternative	Duration of O&M (years)	Duration of Monitoring (years)	Capital Costs	Total O&M Costs	Average Annual O&M Costs	NPV of O&M Costs	Total Monitoring Costs	Average Annual Monitoring Costs	NPV of Monitoring Costs	Total Remedy Costs	NPV of Total Remedy Costs
EZVI - Pneumatic Injection (nZVI)	0	10	\$1,013,297	\$0	\$0	\$0	\$295,200	\$29,520	\$262,597	\$1,308,497	\$1,275,894
EZVI - Pneumatic Injection (mZVI)	0	10	\$671,785	\$0	\$0	\$0	\$295,200	\$29,520	\$262,597	\$966,985	\$934,382
EZVI - Direct Injection (nZVI)	0	10	\$1,013,975	\$0	\$0	\$0	\$295,200	\$29,520	\$262,597	\$1,309,175	\$1,276,572
EZVI - Direct Injection (mZVI)	0	10	\$672,463	\$0	\$0	\$0	\$295,200	\$29,520	\$262,597	\$967,663	\$935,060
ISCO	3	13	\$417,731	\$418,578	\$139,526	\$402,216	\$383,760	\$29,520	\$328,664	\$1,220,069	\$1,148,610
Pump and Treat	30	30	\$380,376	\$1,723,680	\$57,456	\$1,202,475	\$1,476,000	\$49,200	\$1,029,688	\$3,580,056	\$2,612,539
Source Area Bulk Volume (ft ³)	96,000	96,000	96,000	96,000	96,000	96,000	96,000	96,000	96,000	96,000	96,000
Source Area Bulk Volume (m ³)	2,718	2,718	2,718	2,718	2,718	2,718	2,718	2,718	2,718	2,718	2,718
Unit Cost Basis (\$ per ft ³ source area)											
Alternative	Duration of O&M (years)	Duration of Monitoring (years)	Capital Costs	Total O&M Costs	Average Annual O&M Costs	NPV of O&M Costs	Total Monitoring Costs	Average Annual Monitoring Costs	NPV of Monitoring Costs	Total Remedy Costs	NPV of Total Remedy Costs
EZVI - Pneumatic Injection (nZVI)	0	10	\$10.56	\$0.00	\$0.00	\$0.00	\$3.08	\$0.31	\$2.74	\$13.63	\$13.29
EZVI - Pneumatic Injection (mZVI)	0	10	\$7.00	\$0.00	\$0.00	\$0.00	\$3.08	\$0.31	\$2.74	\$10.07	\$9.73
EZVI - Direct Injection (nZVI)	0	10	\$10.56	\$0.00	\$0.00	\$0.00	\$3.08	\$0.31	\$2.74	\$13.64	\$13.30
EZVI - Direct Injection (mZVI)	0	10	\$7.00	\$0.00	\$0.00	\$0.00	\$3.08	\$0.31	\$2.74	\$10.08	\$9.74
ISCO	3	13	\$4.35	\$4.36	\$1.45	\$4.19	\$4.00	\$0.31	\$3.42	\$12.71	\$11.96
Pump and Treat	30	30	\$3.96	\$17.96	\$0.60	\$12.53	\$15.38	\$0.51	\$10.73	\$37.29	\$27.21
Unit Cost Basis (\$ per m ³ source area)											
Alternative	Duration of O&M (years)	Duration of Monitoring (years)	Capital Costs	Total O&M Costs	Average Annual O&M Costs	NPV of O&M Costs	Total Monitoring Costs	Average Annual Monitoring Costs	NPV of Monitoring Costs	Total Remedy Costs	NPV of Total Remedy Costs
EZVI - Pneumatic Injection (nZVI)	0	10	\$372.75	\$0.00	\$0.00	\$0.00	\$108.59	\$10.86	\$96.60	\$481.35	\$469.35
EZVI - Pneumatic Injection (mZVI)	0	10	\$247.12	\$0.00	\$0.00	\$0.00	\$108.59	\$10.86	\$96.60	\$355.72	\$343.72
EZVI - Direct Injection (nZVI)	0	10	\$373.00	\$0.00	\$0.00	\$0.00	\$108.59	\$10.86	\$96.60	\$481.59	\$469.60
EZVI - Direct Injection (mZVI)	0	10	\$247.37	\$0.00	\$0.00	\$0.00	\$108.59	\$10.86	\$96.60	\$355.97	\$343.97
ISCO	3	13	\$153.67	\$153.98	\$51.33	\$147.96	\$141.17	\$10.86	\$120.90	\$448.82	\$422.53
Pump and Treat	30	30	\$139.93	\$634.07	\$21.14	\$442.34	\$342.96	\$18.10	\$378.78	\$1,316.96	\$961.05

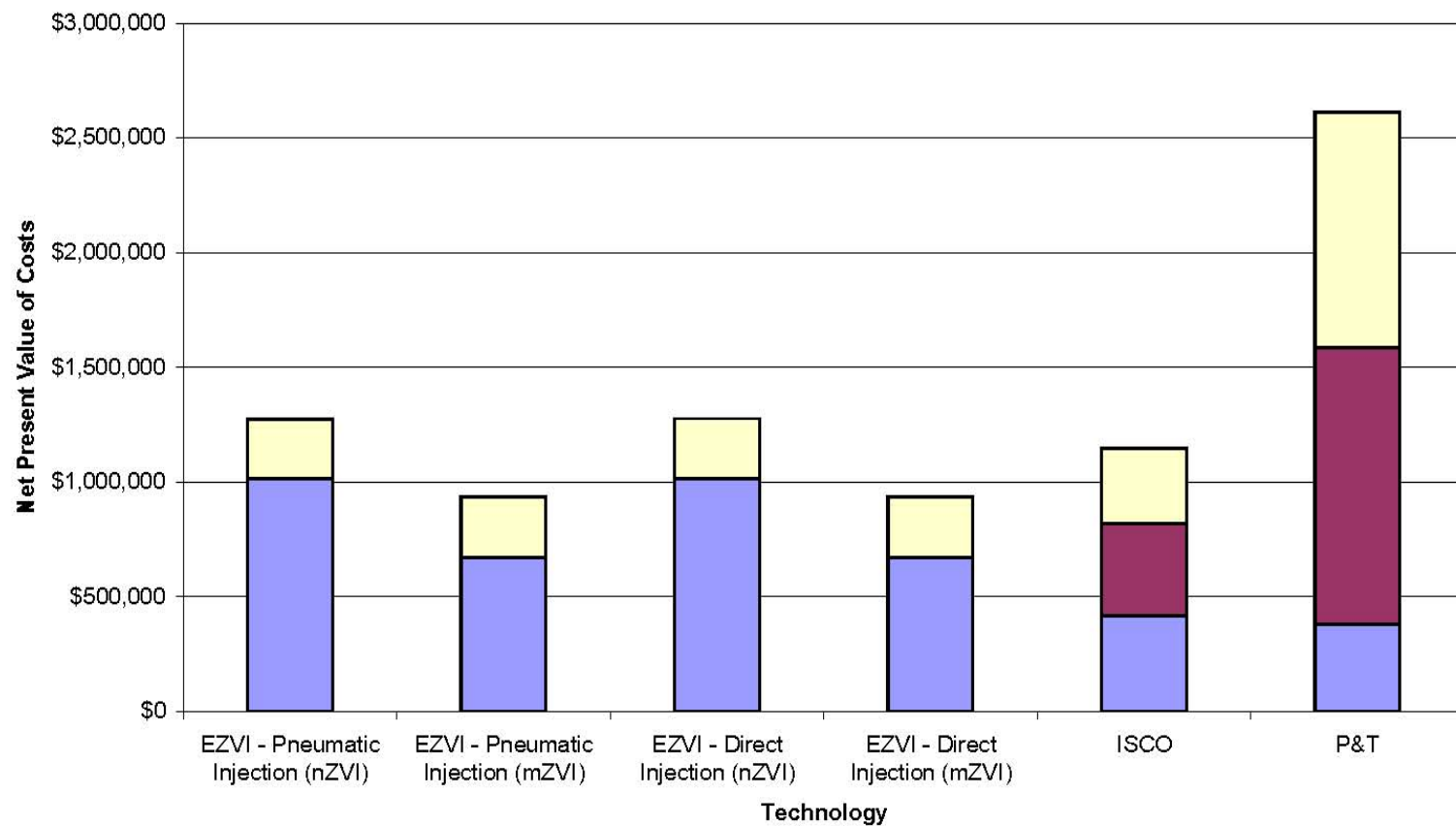
Notes:

ft³ - cubic feet

m³ - cubic meters

O&M - Operation and Maintenance

NPV - Net Present Value



Legend

- Long-Term Monitoring Costs
- O&M Costs
- Capital Costs

NPV of Costs for EZVI, ISCO and P&T Options

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec consultants

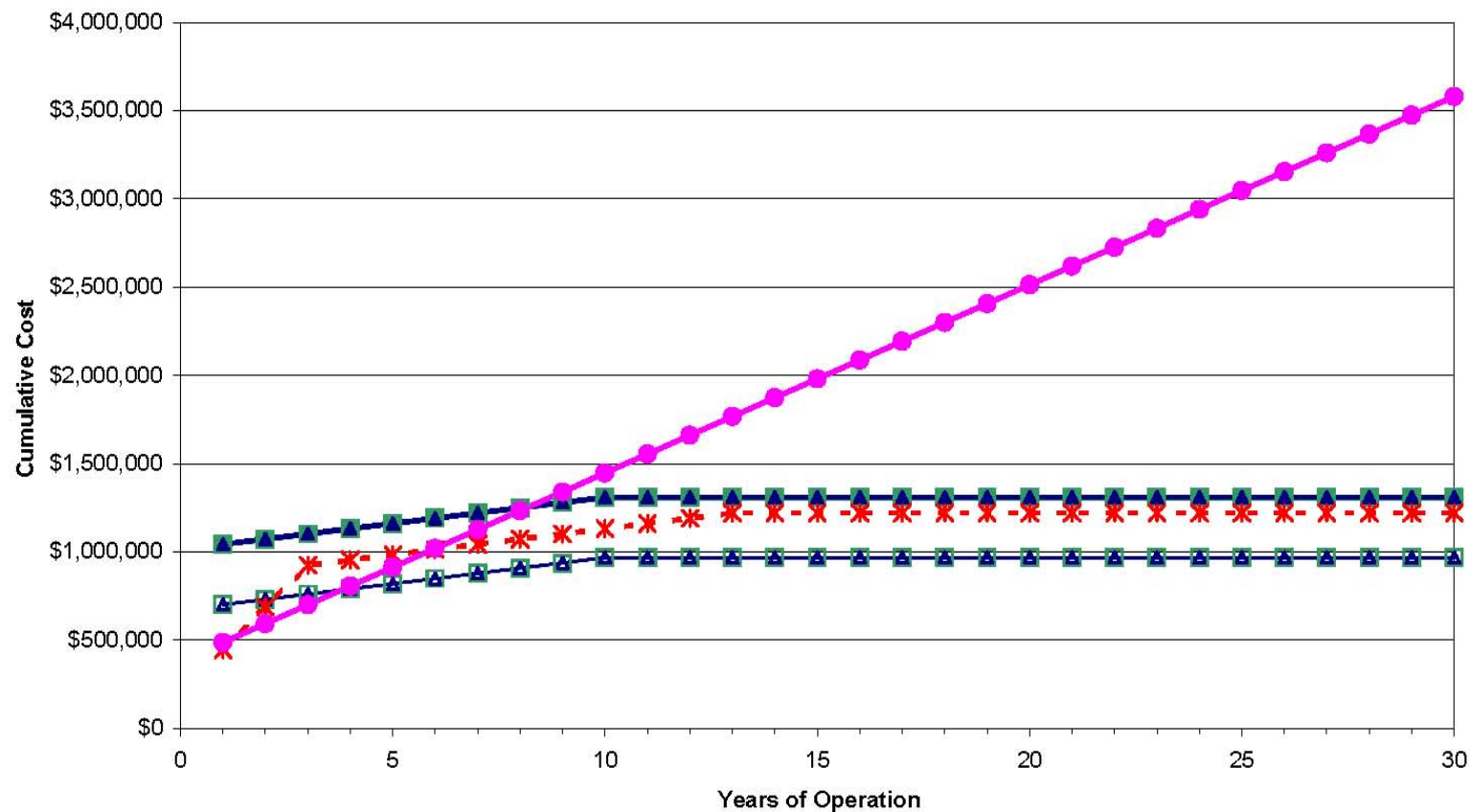
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Figure

7-1

P:\P&T\Project\PA113_EZVI_Demo\008 7 - Reporting\Visual Technical Report\Notes\Table 7-2 to 7-3 - Cost Analysis\Table 7-4 - EZVI Direct Inj



Legend

- EZVI - Pneumatic Injection (nZVI)
- EZVI - Pneumatic Injection (mZVI)
- ▲ EZVI - Direct Injection (nZVI)
- △ EZVI - Direct Injection (mZVI)
- * - ISCO
- P&T

Cumulative Costs for EZVI, ISCO and P&T Alternatives

Site 45, Parris Island MCRD, Parris Island, SC

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consultants

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Figure

7-2

8.0 IMPLEMENTATION ISSUES

This section provides information that will assist in future implementations of the technology. The following are key issues related to implementation of the EZVI technology.

8.1 POTENTIAL ENVIRONMENTAL ISSUES

8.1.1 Regulatory Issues

For this pilot test, an underground injection control (UIC) permit was required by SDHEC. At full-scale, a UIC permit will be required in most jurisdictions for the injection of EZVI and the extraction and re-injection of contaminated groundwater if co-injection of groundwater with the EZVI is being conducted. EZVI is composed of vegetable oil, food grade surfactant and ZVI particles, all of which are routinely injected or emplaced into the subsurface for groundwater remediation purposes. It is therefore expected that acquiring a UIC permit should not be difficult.

8.1.2 Air Discharge

The EZVI process described will not normally result in discharge of chemicals to the atmosphere.

8.1.3 Wastewater Discharge

The EZVI process described will not normally result in the generation of wastewater streams. Any extracted groundwater is normally re-injected into the injection points to aid in the distribution of the EZVI. Some small quantities of wastewater may be generated during well installation and groundwater sampling events and must be managed as they would be for other investigation derived waste.

8.1.4 Waste Storage, Treatment, and Disposal

The EZVI process described will not normally result in the generation of significant waste streams. Some waste may be generated during well installation and groundwater sampling and must be managed as they would be for other investigation derived waste.

8.2 END-USER ISSUES

Potential end-users of this technology include responsible parties for contaminated sites where DNAPL is present in groundwater. End-users will have an interest in the technology because it can potentially treat groundwater *in situ* at an overall cost much less than for conventional pump and treat remediation approaches and other source zone remediation technologies like ISCO. End-users and other stakeholders may have concerns regarding: 1) the effectiveness of the technology in reducing concentrations of target compounds below

appropriate criteria; 2) potential negative impacts of using nanoscale iron in the environment; and 3) potential negative impacts of the EZVI addition on secondary water characteristics.

8.3 PROCUREMENT ISSUES

There are no specialized equipment components required to implement EZVI and no specialized services required. There are a number of nanoscale iron and microscale iron vendors as well as vendors of pre-made EZVI. There are no significant procurement issues with the application of this technology.

8.4 DESIGN ISSUES

Based on the results of the demonstration conducted at the Parris Island Site and a review of other applications of the technology potential design issue to be considered in the development of the design of EZVI treatments were identified. These design issues are discussed below.

- **Daylighting of EZVI:** During EZVI injection, if a vertical pathway connects the injection interval with the surface, it may provide a preferential flow path for EZVI to travel through and daylight at the surface. Vertical fractures may exist naturally or may be created during injection activities or during pre-injection investigation activities (boreholes, wells, MIP borings). Vertical pathways should be plugged with bentonite prior to EZVI injections. If new pathways are discovered during injection, EZVI injections may have to be stopped until the vertical pathways are sealed to prevent daylighting of EZVI. In addition, if the location of the injection point allows the flexibility of movement (not in a key location in the target treatment interval or adjacent to a building or utilities that preclude moving it) it is possible that abandoning that injection point and moving it a few feet in any direction may prevent short-circuiting.
- **Distribution of EZVI in Subsurface:** Many of the distribution issues that were observed in this demonstration were due to the short-circuiting of the EZVI to surface through preferential pathways (boreholes and well casings) and the care that had to be taken during injection due to the very shallow nature (6 to 8 ft bgs) of the target treatment interval. The EZVI that was injected into the pneumatic injection plot was approximately 275 gal less than the targeted amount. This made distribution difficult since we attempted to distribute a smaller volume over a larger area. Based on the injection testing that was done at LC34 (see Demonstration Plan; Geosyntec Consultants, Inc. 2006b), pneumatic injection should have been able to evenly distribute the EZVI over 5 ft ROI in a uniform sandy aquifer. It is expected that if there were less short-circuit pathways and we had been focused on a deeper treatment interval (below 15 ft bgs) we would have achieved a more even distribution.

In addition, as mentioned above, if a less viscous EZVI could be formulated, possibly using a surface modified nZVI particle that would not agglomerate which would allow the EZVI droplets to form on an nZVI particle basis with droplet sizes similar to EVO, it

is possible that improved delivery could be achieved with an ease of injection similar to the injection of EVO.

- **Micro Scale Iron Versus Nano Scale Iron in EZVI:** The main advantages of nZVI versus micro scale iron (mZVI) are the greater surface area, which corresponds to faster reaction rates with contaminants since they are surface mediated reactions, and the small size which is supposed to aid in the mobility and distribution of the particles in the subsurface. EZVI made with mZVI is almost as stable and as reactive as EZVI made up with nZVI. An evaluation of the costs for EZVI demonstrates that the technology can be applied at a much lower cost if mZVI is used instead of nZVI. The price for nZVI is approximately \$20 per pound versus \$5 per pound for mZVI. The use of mZVI instead of nZVI will significantly improve the economics of the EZVI technology.

An additional consideration for using mZVI rather than nZVI is the perceived public and regulatory concerns with the potential health and environmental risks associated with nano-scale particles in the environment. Although the nZVI from Toda that was used in this demonstration normally agglomerates such that the particles are larger than the 100 to 200 nanometer range that appears to be the cut off for concern in the scientific research to date, there is still a potential that the use of nZVI will be a concern to the public and to regulators.

Once the nZVI is emulsified to form EZVI, the emulsion droplets are on the micron scale and due to size and viscosity issues are not mobile in the subsurface. So the advantage of using nZVI versus mZVI in EZVI is solely one of increased rate of reactivity. Although the degradation rates for target compounds with mZVI may not be as fast as with nZVI, it appears that the effective degradation rate with EZVI is limited by the rate of diffusion of target compounds across the oil liquid membrane on the outside of the EZVI droplets. If this is the case, there may not be significant differences in the performance of EZVI made with mZVI or nZVI. It is possible that if a modified nZVI product was used that did not agglomerate, the EZVI droplets might form on the iron particle size and the EZVI droplets would be in the nanoscale size range. This could provide a significant advantage for using nZVI since the mobility and distribution of this EZVI would be much greater than that made with mZVI.

- **Bioaugmentation:** Bioaugmentation cultures can be added to the subsurface at the time of injection to improve the rate of complete degradation of chlorinated ethenes to ethene. Bioaugmentation was not conducted during the demonstration at Parris Island because prior molecular testing conducted by the Navy suggested that Dhc organisms associated with complete biodegradation of c-DCE and VC were present. It is possible that the addition of a bioaugmentation culture may have increased the rate of degradation of c-DCE and VC and resulted in greater reductions in these compounds being observed. Molecular testing can now be conducted to determine if microorganisms with the ability to dechlorinate VC to ethene are present at a specific site. If these organisms are not

observed to be present it is likely that bioaugmentation will significantly improve the rate of degradation of chlorinated ethenes associated with the biodegradation component of the EZVI technology.

- **EZVI versus Co-Injection:** Alternate injection approaches that still use nZVI or mZVI and emulsified vegetable oil (EVO) may be considered. Rather than emulsifying ZVI into vegetable oil to create EZVI above ground prior to injection it is possible to inject each of the components (ZVI and EVO) as separate materials either at the same time (co-injection) or during different injection events. Some degree of emulsification may occur in the subsurface following co-injection but the resulting material is likely to be somewhat different from EZVI prepared above ground and injected into the subsurface. No experimental work has been conducted to evaluate the how the different approaches to injection of ZVI and EVO will impact the effectiveness of the technology but the advantages of the two approaches (i.e., emulsifying ZVI into the EVO prior to injection and injecting ZVI and EVO as separate components) are discussed below.

Advantages of EZVI over ZVI and EVO Injection

- EZVI has the ability to reduce flux more quickly than straight vegetable oil since it is able to both sequester (immediate mass flux reduction) and degrade at the same time as seen in the laboratory studies reported in the Final Laboratory Treatability Report For: Emulsified Zero Valent Iron Treatment of Chlorinated Solvent DNAPL Source Areas (GeoSyntec, 2005a).
- It is believed that EZVI can enhance contact between ZVI and the VOCs being degraded by partitioning with the DNAPL and distribution the ZVI throughout the DNAPL. As such it is not reliant on the dissolution of the DNAPL at the edges of the NAPL for degradation to occur. Degradation of the DNAPL is likely to occur faster with the EZVI than with ZVI and oil separately.
- The oil membrane of the EZVI protects the ZVI particles from being used up in unwanted secondary reactions with other constituents in the groundwater (i.e., inorganics or oxygen).
- The use of EZVI reduces the potential for the oil to coat the surface of the iron during or after injection reducing the reactivity of the iron.

Advantages of ZVI and EVO over EZVI Injection

- EVO is much easier to inject and distribute in the subsurface than EZVI so a better distribution of EVO may be achieved if it is injected rather than EZVI. If a less viscous EZVI could be formulated, possibly using a surface modified nZVI particle that would not agglomerate which would allow the EZVI droplets to form on an nZVI particle basis with droplet sizes similar to EVO, it is possible that

improved delivery could be achieved with an ease of injection similar to the injection of EVO.

- Whether nanoscale ZVI or a micro scale is used as the iron source, the ZVI would not likely allow a much better distribution than EZVI since the nZVI tends to agglomerate to a micro size or greater particle and filter out in the subsurface. The ZVI would require a similar injection density as the EZVI (direct injection of only a few feet ROI or pneumatic injection with up to 10 ft ROI). However, the injection could be more aggressive since there would be no concern with damaging the emulsion structure, so there might be some slight advantages on the distribution compared with EZVI.

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APPENDIX A
POINTS OF CONTACT

TABLE A-1: POINTS OF CONTACT
Parris Island, South Carolina

Geosyntec Consultants

Point of Contact	Organization	Phone/Fax/E-mail	Role in Project
Tom Krug	Geosyntec Consultants	(519) 822-2230 Ext. 242 Fax (519) 822-3151 tkrug@geosyntec.com	Principal Investigator
Suzanne O'Hara	Geosyntec Consultants	(519) 822-2230 Ext. 234 Fax: (519) 822-3151 sohara@geosyntec.com	Project Manager
Mark Watling	Geosyntec Consultants	(519) 822-2230 Ext. 316 Fax (519) 822-3151 mwatling@geosyntec.com	Field Study Leader, QA/QC Officer
Dr. Jacqueline Quinn	NASA	(321) 867-8410 Fax (321) 867-9161 Jacqueline.W.Quinn@nasa.gov	Technical Advisor
Dr. Robert Puls	US. EPA, National Risk Management Research Laboratory	(580) 436-8543 Fax (580) 436-8525 puls.robert@epa.gov	Technical Advisor
Dr. Chunming Su	US. EPA, National Risk Management Research Laboratory	(580) 436-8638 Fax (580) 436-8703 Su.Chunming@epamail.epa.gov	Technical Advisor/Chemist
Dr. Nancy Ruiz	NAVFAC ESC	(805) 982-1155 Fax (805) 982-4304 nancy.ruiz@navy.mil	Technical Advisor
Timothy J. Harrington	MCRD, Parris Island, SC, Deputy Natural Resources & Environmental Affairs Office	(843) 228-3423 Fax (843) 228-3566 timothy.j.harrington@usmc.mil	Installation Restoration Program Manager
Art Sanford	NAVFAC South	(843) 820-7482 Fax (843) 820-7465 art.Sanford@navy.mil	NAVFAC South RPM
Cliff Casey	NAVFAC South	(843) 820-5561 Fax (843) 820-7465 cliff.casey@navy.mil	NAVFAC South Technical Support
Don Hargrove	SCDHEC	(803) 896-4033 Fax (803) 896-4002 hargrodc@dhec.sc.gov	SCDHEC Representative
Jerry Stamps	SCDHEC	(803) 896-4285 Fax (803) 896-4002 stampsjm@dhec.sc.gov	SCDHEC Representative
Lila Llamas	USEPA, Region 4	(404) 562-9969 Fax (404)-562-8518 Koroma-Llamas.Lila@epamail.epa.gov	US EPA Region 4

APPENDIX B
BOREHOLE LOGS

Borehole No. SC-1

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Borehole Log

Project No.:	TR0173	Location:	Site 45 Paris Island MCRD
Client:	ESTCP	Coordinates:	N 187402.87 E 2099300.24
Logged By:	S. O'Hara	Borehole Diameter:	1.5 inch
Reviewed By:		Site Datum:	Vertical NAVD 88; Horizontal NAD 83
Drilling Company:	EPA - B. Scroggins	Ground Surface Elevation:	6.81 ft amsl
Drilling Method:	Direct Push - butyrate liners	Top PVC Casing Elevation:	Not Applicable
Well Material:	Not Applicable	Completion Date:	13 June 2005

Depth (')	Depth (feet)	Water Level	Stratigraphy	Lithologic Description	Geologic Samples				Comments
					Unified Soil Classification	Recovery (%)	Blowcount	PID (ppmv)	
				no recovery		NA	NA	NA	
5				sand, fine grained, reddish brown mottled red and light grey, silt lenses	SW	100	NA	NA	SC-1-6
				clay lenses black mottling		50	NA	NA	SC-1-8
				no recovery		0	NA	NA	NR
10				sand, well sorted, fine grained, light grey	SW	60	NA	NA	SC-1-12
						60	NA	NA	SC-1-14
				trace silt, darker grey		80	NA	NA	SC-1-16
15				trace clay		100	NA	NA	SC-1-18
				clay, trace sand and organics (wood), dark grey	CH				
				peat, dark brown to black, organic odour (VOCs)	PT	100	NA	NA	SC-1-20
20				clay, plastic, dark grey, organic odour	CH				
				Borehole depth 20.0 ft					

Notes:
NA - not available
NR - no recovery

Borehole No. SC-2

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Borehole Log

Project No.:	TR0173	Location:	Site 45 Paris Island MCRD
Client:	ESTCP	Coordinates:	N 187391.66 E 2099298.04
Logged By:	S. O'Hara	Borehole Diameter:	1.5 inch
Reviewed By:		Site Datum:	Vertical NAVD 88; Horizontal NAD 83
Drilling Company:	EPA - B. Scroggins	Ground Surface Elevation:	7.01 ft amsl
Drilling Method:	Direct Push - butyrate liners	Top PVC Casing Elevation:	Not Applicable
Well Material:	Not Applicable	Completion Date:	13 June 2005

Depth (')	Depth (feet)	Water Level	Stratigraphy	Lithologic Description	Geologic Samples				Comments
					Unified Soil Classification	Recovery (%)	Blowcount	PID (ppmv)	
				no recovery		NA	NA	NA	
				sand, trace silt, fine grained, dense, light brown to orange					
				increase in grey colour, orange mottling		100	NA	NA	SC-2-6
				grey with red mottling, clay/silt lenses, traces of black staining, strong BTEX odour near lenses	SW	100	NA	NA	SC-2-8
				sandy clay, soft, grey		100	NA	NA	SC-2-10
				dark grey	CHS	100	NA	NA	SC-2-12
				sand, fine grained, sugary texture, dense, light grey	SW				
				sandy clay, dark grey	CHS	100	NA	NA	SC-2-14
				silty sand, dark grey					
					SM	100	NA	NA	SC-2-16
						100	NA	NA	SC-2-18
				clay, trace organics (wood), stiff, dark grey	OL	18	NA	NA	SC-2-18.5
				peat	PT	100	NA	NA	SC-2-20
				Borehole depth 20.0 ft					Notes: NA - not available

Borehole No. SC-3

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Borehole Log

Project No.:	TR0173	Location:	Site 45 Paris Island MCRD
Client:	ESTCP	Coordinates:	N 187381.55 E 2099295.08
Logged By:	S. O'Hara	Borehole Diameter:	1.5 inch
Reviewed By:		Site Datum:	Vertical NAVD 88; Horizontal NAD 83
Drilling Company:	EPA - B. Scroggins	Ground Surface Elevation:	7.11 ft amsl
Drilling Method:	Direct Push - butyrate liners	Top PVC Casing Elevation:	Not Applicable
Well Material:	Not Applicable	Completion Date:	13 June 2005

Depth (')	Depth (feet)	Water Level	Stratigraphy	Lithologic Description	Geologic Samples				Comments
					Unified Soil Classification	Recovery (%)	Blowcount	PID (ppmv)	
				no recovery		NA	NA	NA	
				sand, fine grained, dense, grey	SW	50	NA	NA	SC-3-6
				trace clay lenses, trace red-brown mottling					
				orange mottling		100	NA	NA	SC-3-8
				soft, plastic, orange-brown, sharp transition to grey clay					
				clayey sand, black banding, organic odour	SC	100	NA	NA	SC-3-10
				clay, soft, light grey, silt and sand lenses	CH				
				sand, fine grained, light grey	SW	100	NA	NA	SC-3-12
				dark grey, wet trace silt		75	NA	NA	SC-3-14
				medium to fine grained, grey to dark grey		100	NA	NA	SC-3-16
				trace wood fragments		50	NA	NA	SC-3-18
				peat, strong odour of VOCs	PT	100	NA	NA	SC-3-20
				clay, dark grey, some organics (wood)	CL				
				Borehole depth 20.0 ft					

Notes:
NA - not available

Borehole No. SC-4

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Borehole Log

Project No.:	TR0173	Location:	Site 45 Paris Island MCRD
Client:	ESTCP	Coordinates:	N 187394.36 E 2099302.78
Logged By:	S. O'Hara	Borehole Diameter:	1.5 inch
Reviewed By:		Site Datum:	Vertical NAVD 88; Horizontal NAD 83
Drilling Company:	EPA - B. Scroggins	Ground Surface Elevation:	6.85 ft amsl
Drilling Method:	Direct Push - butyrate liners	Top PVC Casing Elevation:	Not Applicable
Well Material:	Not Applicable	Completion Date:	13 June 2005

Depth (')	Depth (feet)	Water Level	Stratigraphy	Lithologic Description	Geologic Samples				Comments
					Unified Soil Classification	Recovery (%)	Blowcount	PID (ppmv)	
				no recovery		NA	NA	NA	
5				sand, fine grained, grey, brown-orange mottling	SW	50	NA	NA	SC-4-6
				clayey sand	SC				
				sand, fine grained, grey, brown-orange mottling	SW	60	NA	NA	SC-4-8
				clay, stiff, light grey, trace brown mottling	CL				
				sandy clay, soft, light grey	CHS	70	NA	NA	SC-4-10
10				sand, trace silt, fine grained, light grey					
				medium to fine grained, dark grey	SW	100	NA	NA	SC-4-12
				silty sand, trace clay, fine grained, grey		100	NA	NA	SC-4-14
					SM	100	NA	NA	SC-4-16
15				clay, trace organics, plastic, dark grey	CH	100	NA	NA	SC-4-18
				peat, dark brown to black, large wood fragments	PT	90	NA	NA	SC-4-20
				clay, dark grey	CH				
20				Borehole depth 20.0 ft					
									Notes: NA - not available

Borehole No. SC-5

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Borehole Log

Project No.:	TR0173	Location:	Site 45 Paris Island MCRD
Client:	ESTCP	Coordinates:	Not Surveyed
Logged By:	S. O'Hara	Borehole Diameter:	1.5 inch
Reviewed By:		Site Datum:	Vertical NAVD 88; Horizontal NAD 83
Drilling Company:	EPA - B. Scroggins	Ground Surface Elevation:	Not Surveyed
Drilling Method:	Direct Push - butyrate liners	Top PVC Casing Elevation:	Not Applicable
Well Material:	Not Applicable	Completion Date:	14 June 2005

Depth (')	Depth (feet)	Water Level	Stratigraphy	Lithologic Description	Geologic Samples				Comments
					Unified Soil Classification	Recovery (%)	Blowcount	PID (ppmv)	
				no recovery		NA	NA	NA	
5				sand, some silt, fine grained, dense, dark grey		50	NA	NA	SC-5-6
				less silt content, fine to medium grained, light grey, clay lenses trace silt and clay mottled brown	SM	80	NA	NA	SC-5-8
				clay	CH				
				sandy clay, plastic, grey, silty sand lenses	CHS	70	NA	NA	SC-5-10
10				sand, trace silt, grey					
				sugary texture, light grey		100	NA	NA	SC-5-12
				fine to medium grained, dark grey higher silt content	SW	100	NA	NA	SC-5-16
15				silty sand, medium grained, dark grey, organic odour, stiff dark grey clay at 17'6"	SM	25	NA	NA	SC-5-18
				peat, large wood pieces	PT	100	NA	NA	SC-5-20
20				clay, dark grey Borehole depth 20.0 ft	CL				

Notes:
NA - not available

Borehole No. SC-6

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Borehole Log

Project No.:	TR0173	Location:	Site 45 Paris Island MCRD
Client:	ESTCP	Coordinates:	Not Surveyed
Logged By:	S. O'Hara	Borehole Diameter:	1.5 inch
Reviewed By:		Site Datum:	Vertical NAVD 88; Horizontal NAD 83
Drilling Company:	EPA - B. Scroggins	Ground Surface Elevation:	Not Surveyed
Drilling Method:	Direct Push - butyrate liners	Top PVC Casing Elevation:	Not Applicable
Well Material:	Not Applicable	Completion Date:	14 June 2005

Depth (')	Depth (feet)	Water Level	Stratigraphy	Lithologic Description	Geologic Samples				Comments
					Unified Soil Classification	Recovery (%)	Blowcount	PID (ppmv)	
				no recovery		NA	NA	NA	
5				sand, trace silt, fine grained, brown mottling, clay lenses	SW	50	NA	NA	SC-6-6
				clay, orange-brown, brown mottling light grey	CL	100	NA	NA	SC-6-8
10				sand, fine to medium grained, sugary texture, light grey		100	NA	NA	SC-6-12
				trace silt, dark grey	SW				
15				some silt	SW	90	NA	NA	SC-6-16
5				clay, plastic, soft	CH	70	NA	NA	SC-6-18
				peat	PT	100	NA	NA	SC-6-20
20				clay, plastic, dark grey	CH				
				Borehole depth 20.0 ft					
									Notes: NA - not available

Report: MASTER; File: P:\PRJ\GINT\PROJECTS\TR0173.GPJ; 11/4/2009

Borehole No. SC-8

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Borehole Log

Project No.:	TR0173	Location:	Site 45 Paris Island MCRD
Client:	ESTCP	Coordinates:	N 187377.29 E 2099288.39
Logged By:	S. O'Hara	Borehole Diameter:	1.5 inch
Reviewed By:		Site Datum:	Vertical NAVD 88; Horizontal NAD 83
Drilling Company:	EPA - B. Scroggins	Ground Surface Elevation:	7.01 ft amsl
Drilling Method:	Direct Push - butyrate liners	Top PVC Casing Elevation:	Not Applicable
Well Material:	Not Applicable	Completion Date:	15 June 2005

Depth (')	Depth (feet)	Water Level	Stratigraphy	Lithologic Description	Geologic Samples				Comments
					Unified Soil Classification	Recovery (%)	Blowcount	PID (ppmv)	
				no recovery		NA	NA	NA	
5				clayey sand, fine to medium grained, dark grey, strong organic odour	SC	85	NA	NA	SC-8-6
				sand, light grey, strong organic odour, trace silt and clay lenses brown lenses sandy clay lenses	SP	100	NA	NA	SC-8-8
				red-brown mottling black banding	CL				
				clay, stiff, plastic, light grey, organic odour	CLM	100	NA	NA	SC-8-10
10				silty clay, trace sand, soft, light grey, organic odour	SPMC	100	NA	NA	SC-8-12
				silty/clayey sand, dark grey, sheen strong odour		100	NA	NA	SC-8-14
				sand, fine to medium grained, sugary texture, dark grey		100	NA	NA	SC-8-16
15				higher silt content	SW	90	NA	NA	SC-8-18
				clay, firm, plastic, dark grey	CL	100	NA	NA	SC-8-20
				peat, dark brown, wood pieces	PT				
20				clay, dark grey	CL				
				Borehole depth 20.0 ft					Notes: NA - not available

Borehole No. SC-9

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Borehole Log

Project No.:	TR0173	Location:	Site 45 Paris Island MCRD
Client:	ESTCP	Coordinates:	N 187388.21 E 2099294.67
Logged By:	S. O'Hara	Borehole Diameter:	1.5 inch
Reviewed By:		Site Datum:	Vertical NAVD 88; Horizontal NAD 83
Drilling Company:	EPA - B. Scroggins	Ground Surface Elevation:	7.02 ft amsl
Drilling Method:	Direct Push Core	Top PVC Casing Elevation:	Not Applicable
Well Material:	Not Applicable	Completion Date:	21 June 2006

Depth (')	Depth (feet)	Water Level	Stratigraphy	Lithologic Description	Geologic Samples					Comments
					Unified Soil Classification	Recovery (%)	Blowcount	PID (ppmv)	Soil Sample ID	
				Not Sampled/Cored		NA	NA	NA	NA	
	5			SILTY SAND - grey, with grey clay stingers, rust coloured	SM	NA	NA	NA	SC-9-6	
				CLAY - light grey, plastic SILTY SAND - orange	CH SM	NA	NA	NA	SC-9-8	
				SILTY CLAY - light grey trace sand	CL					
	10			- grades to sandy clay		NA	NA	NA	SC-9-10	
						NA	NA	NA	SC-9-12	
						NA	NA	NA	SC-9-14	
	15			- sand becomes silty very loose dirty gray / dark slightly coarser grainey		NA	NA	NA	SC-8-16	
	5					NA	NA	NA	SC-9-18	
				CLAY - dark, plastic rim PEAT	CH					
						NA	NA	NA	SC-9-20	
	20			Borehole depth 20.0 ft						

APPENDIX C

WATER LEVEL ELEVATION TABLES

LIST OF TABLES

Table C-1:	June 2006 Water Level Elevations
Table C-2:	August 2006 Water Level Elevations
Table C-3:	November 2006 Water Level Elevations
Table C-4:	January 2007 Water Level Elevations
Table C-5:	March 2007 Water Level Elevations
Table C-6:	July 2007 Water Level Elevations
Table C-7:	January 2008 Water Level Elevations
Table C-8:	July 2008 Water Level Elevations
Table C-9:	March 2009 Water Level Elevations

TABLE C-1: JUNE 2006 WATER LEVEL ELEVATIONS
Parris Island, South Carolina

Geosyntec Consultants

Well ID	Date	Time	Groundwater Level (ft btoc)	TOC Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Groundwater Elevation (ft amsl)	Groundwater Level (ft btoc)	Comments
PMW-1	26-Jun-06	8:35	3.50	6.88	7.09	3.379	3.71	pre-sample
PMW-1	26-Jun-06	11:11	4.32	6.88	7.09	2.559	4.53	post-sample
PMW-2	26-Jun-06	11:17	3.63	6.99	7.14	3.360	3.78	pre-sample
PMW-2	26-Jun-06	13:15	4.04	6.99	7.14	2.950	4.19	post-sample
PMW-6	26-Jun-06	13:57	3.70	6.89	7.08	3.191	3.89	pre-sample
PMW-6	26-Jun-06	15:35	3.77	6.89	7.08	3.121	3.96	post-sample
PMW-3	26-Jun-06	15:41	3.71	6.98	7.14	3.273	3.87	pre-sample
PMW-3	26-Jun-06	17:01	3.80	6.98	7.14	3.183	3.96	post-sample
PMW-4	26-Jun-06	17:06	3.61	6.83	7.08	3.222	3.86	pre-sample
PMW-4	26-Jun-06	18:58	3.80	6.83	7.08	3.032	4.05	post-sample
PMW-5	27-Jun-06	8:00	3.48	6.87	7.17	3.387	3.78	pre-sample
PMW-5	27-Jun-06	9:25	4.07	6.87	7.17	2.797	4.37	post-sample
MW-06 SU	29-Jun-06	8:31	3.40	6.56	-	3.160	-	
MW-07 SU	29-Jun-06	8:39	3.55	7.68	-	4.130	-	
AMW-4	29-Jun-06	9:00	3.33	-	-	-	-	
AMW-5	29-Jun-06	9:09	3.25	-	-	-	-	
AW-3	29-Jun-06	9:11	3.37	-	-	-	-	
MW-08 SU	29-Jun-06	9:30	3.41	7.60	-	4.192	-	
MW-08 SL	29-Jun-06	9:42	3.33	7.53	-	4.205	-	
AW-2	29-Jun-06	9:44	3.44	-	-	-	-	
AMW-3	29-Jun-06	9:47	3.67	-	-	-	-	
MW-22 SU	29-Jun-06	10:34	3.28	6.61	-	3.335	-	
MW-22 SL	29-Jun-06	10:37	3.22	6.56	-	3.343	-	
MW-21 SL	29-Jun-06	10:44	3.19	6.39	-	3.198	-	
MW-21 SU	29-Jun-06	10:47	3.28	6.43	-	3.147	-	
MW-24 SU	29-Jun-06	16:39	3.40	6.63	-	3.230	-	
PMW-4	29-Jun-06	16:42	3.48	6.83	7.08	3.349	3.73	
PMW-5	29-Jun-06	16:44	3.53	6.87	7.17	3.334	3.84	
PMW-6	29-Jun-06	16:47	3.55	6.89	7.08	3.341	3.74	
PMW-2	29-Jun-06	16:49	3.64	6.99	7.14	3.348	3.79	
PMW-1	29-Jun-06	16:51	3.55	6.88	7.09	3.329	3.76	
PMW-3	29-Jun-06	16:53	3.66	6.98	7.14	3.325	3.82	

Notes:

TOC - ftop of casing

ft btoc - feet below top of casing

ft amsl - feet above mean sea level

TABLE C-2: AUGUST 2006 WATER LEVEL ELEVATIONS
Parris Island, South Carolina

Geosyntec Consultants

Well ID	Date	Time	Groundwater Level (ft btoc)	TOC Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Groundwater Elevation (ft amsl)	Groundwater Level (ft bgs)	Comments
PMW-1	21-Aug-06	8:28	4.47	6.88	7.09	2.409	4.68	
PMW-2	21-Aug-06	8:34	4.55	6.99	7.14	2.440	4.70	
PMW-3	21-Aug-06	8:37	4.58	6.98	7.14	2.403	4.74	
PMW-4	21-Aug-06	8:51	4.40	6.83	7.08	2.432	4.65	
PMW-5	21-Aug-06	8:57	4.47	6.87	7.17	2.397	4.77	
PMW-6	21-Aug-06	9:01	4.50	6.89	7.08	2.391	4.69	
MW-01 SU	21-Aug-06	10:56	4.20	6.72	-	2.520	-	Has not been opened in long time
MW-01 SL	21-Aug-06	10:49	4.13	6.69	-	2.560	-	
MW-02 SU	21-Aug-06	11:16	3.88	6.38	-	2.500	-	Ant hill inside vault covering well head - lock will not secure
MW-02 SL	21-Aug-06	11:27	3.95	6.28	-	2.330	-	
MW-03 SU	21-Aug-06	11:56	4.40	6.71	-	2.310	-	
MW-03 SL	21-Aug-06	12:05	3.83	6.67	-	2.840	-	No lock. Water in vault, cap lock on pressure cap broken
MW-06 SU	21-Aug-06	13:00	3.70	6.65	-	2.950	-	No lock. WL meter like product - will not stop beep until spray with DI
MW-06 SL	21-Aug-06	12:29	4.30	6.61	-	2.310	-	No lock
MW-07 SU	21-Aug-06	13:55	4.45	6.80	-	2.350	-	
MW-07 SL	21-Aug-06	14:00	4.48	6.85	-	2.370	-	
MW-08 SU	21-Aug-06	9:39	4.37	6.74	-	2.370	-	
MW-08 SL	21-Aug-06	9:33	4.22	6.67	-	2.450	-	
MW-10 SU	21-Aug-06	12:13	3.52	6.03	-	2.510	-	
MW-10 SL	21-Aug-06	12:17	3.55	5.98	-	2.430	-	
MW-14 SU	21-Aug-06	14:14	4.10	6.02	-	1.920	-	
MW-14 SL	21-Aug-06	14:18	3.00	5.92	-	2.920	-	WL meter like product - will not stop beep until spray with DI. Ear broken in vault
MW-15 SU	21-Aug-06	16:30	6.24	8.47	-	2.230	-	
MW-15 SL	21-Aug-06	16:35	5.45	8.28	-	2.830	-	
MW-16 SU	21-Aug-06	16:47	7.29	9.34	-	2.050	-	
MW-16 SL	21-Aug-06	16:42	7.05	9.33	-	2.280	-	
MW-21 SU	21-Aug-06	11:43	4.19	6.53	-	2.340	-	
MW-21 SL	21-Aug-06	11:37	3.82	6.44	-	2.620	-	
MW-22 SU	21-Aug-06	9:19	4.25	6.66	-	2.410	-	
MW-22 SL	21-Aug-06	9:25	3.70	6.59	-	2.890	-	
MW-23 SU	21-Aug-06	17:05	3.64	6.49	-	2.850	-	WL meter like product
MW-23 SL	21-Aug-06	16:59	3.40	6.41	-	3.010	-	WL meter like product

Notes:

TOC - ft top of casing

ft btoc - feet below top of casing

ft amsl - feet above mean sea level

TABLE C-3: NOVEMBER 2006 WATER LEVEL ELEVATIONS
Parris Island, South Carolina

Geosyntec Consultants

Well ID	Date	Time	Groundwater Level (ft btoc)	TOC Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Groundwater Elevation (ft amsl)	Groundwater Level (ft bgs)
PMW-1	29-Nov-06	8:10	2.82	6.77	7.09	3.950	3.14
PMW-2	29-Nov-06	8:05	2.70	6.76	7.14	4.060	3.08
PMW-3	29-Nov-06	8:00	2.79	6.79	7.14	4.000	3.14
PMW-4	1-Dec-06	8:01	2.64	6.71	7.08	4.070	3.01
PMW-5	2-Dec-06	9:38	2.62	6.75	7.17	4.130	3.04
PMW-6	2-Dec-06	13:06	2.59	6.69	7.08	4.100	2.98

Notes:

TOC - ftop of casing

ft btoc - feet below top of casing

ft amsl - feet above mean sea level

TABLE C-4: JANUARY 2007 WATER LEVEL ELEVATIONS
Parris Island, South Carolina

Geosyntec Consultants

Well ID	Date	Time	Groundwater Level (ft btoc)	TOC Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Groundwater Elevation (ft amsl)	Groundwater Level (ft bgs)
PMW-1	19-Jan-07	14:30	2.43	6.77	7.09	4.340	2.75
PMW-3	19-Jan-07	8:23	2.00	6.79	7.14	4.790	2.35
PMW-5	19-Jan-07	9:59	3.20	6.75	7.17	3.550	3.62
PMW-6	19-Jan-07	13:25	3.42	6.69	7.08	3.270	3.81

Notes:

TOC - ftop of casing

ft btoc - feet below top of casing

ft amsl - feet above mean sea level

TABLE C-5: MARCH 2007 WATER LEVEL ELEVATIONS
Parris Island, South Carolina

Geosyntec Consultants

Well ID	Date	Time	Groundwater Level (ft btoc)	TOC Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Groundwater Elevation (ft amsl)	Groundwater Level (ft bgs)	Comments
PMW-1	19-Mar-07	8:53	3.22	6.77	7.09	3.550	3.54	oil
PMW-2	19-Mar-07	8:59	3.15	6.76	7.14	3.610	3.53	oil
PMW-3	19-Mar-07	9:03	3.25	6.79	7.14	3.540	3.60	
PMW-4	19-Mar-07	9:07	3.12	6.71	7.08	3.590	3.49	
PMW-5	19-Mar-07	9:12	3.34	6.75	7.17	3.410	3.76	oil
PMW-6	19-Mar-07	9:17	3.12	6.69	7.08	3.570	3.51	oil
MW-06 SU	19-Mar-07	9:32	2.83	6.65	-	3.820	-	tubing in well, water in vault, no lock
MW-06 SL	19-Mar-07	9:36	3.12	6.61	-	3.490	-	tubing in well, no lock
MW-07 SU	19-Mar-07	9:46	3.19	6.80	-	3.610	-	tubing in well, no lock
MW-07 SL	19-Mar-07	9:50	3.25	6.85	-	3.600	-	tubing in well
MW-08 SU	19-Mar-07	10:04	2.95	6.74	-	3.790	-	tubing in well, no lock
MW-08 SL	19-Mar-07	10:06	3.00	6.67	-	3.670	-	tubing in well, no lock
MW-21 SU	19-Mar-07	10:56	2.57	6.53	-	3.960	-	tubing in well, no lock
MW-21 SL	19-Mar-07	10:35	2.55	6.44	-	3.890	-	tubing in well, no lock, ants forming nest in vault
MW-22 SU	19-Mar-07	10:26	2.66	6.66	-	4.000	-	tubing in well, no lock
MW-22 SL	19-Mar-07	10:20	2.65	6.59	-	3.940	-	tubing in well, no lock
MW-24 SU	19-Mar-07	11:42	2.28	6.63	-	4.350	-	screw cap, no lock

Notes:

TOC - ftop of casing

ft btoc - feet below top of casing

ft amsl - feet above mean sea level

TABLE C-6: JULY 2007 WATER LEVEL ELEVATIONS
Parris Island, South Carolina

Geosyntec Consultants

Well ID	Date	Time	Groundwater Level (ft btoc)	TOC Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Groundwater Elevation (ft amsl)	Groundwater Level (ft bgs)	Comments
PMW-1	10-Jul-07	9:16	3.01	6.77	7.09	3.760	3.33	
PMW-2	10-Jul-07	9:19	2.98	6.76	7.14	3.780	3.36	water in vault overtop of well head/casing
PMW-3	10-Jul-07	9:22	3.06	6.79	7.14	3.730	3.41	
PMW-4	10-Jul-07	9:25	2.99	6.71	7.08	3.720	3.36	water in vault overtop of well head/casing
PMW-5	10-Jul-07	9:28	3.35	6.75	7.17	3.400	3.77	
PMW-6	10-Jul-07	9:30	3.58	6.69	7.08	3.110	3.97	water in vault overtop of well head/casing
MW-06 SU	19-Jul-07	9:00	3.44	6.65	-	3.210	-	water in vault
MW-06 SL	19-Jul-07	9:10	3.23	6.61	-	3.380	-	tubing in well
MW-07 SU	19-Jul-07	9:20	3.33	6.80	-	3.470	-	tubing in well
MW-07 SL	19-Jul-07	9:27	3.37	6.85	-	3.480	-	tubing in well
MW-08 SU	19-Jul-07	9:33	3.13	6.74	-	3.610	-	tubing in well
MW-08 SL	19-Jul-07	9:38	3.05	6.67	-	3.620	-	tubing in well, one bolt stripped out
MW-21 SU	19-Jul-07	10:33	2.97	6.53	-	3.560	-	tubing in well
MW-21 SL	19-Jul-07	10:40	2.84	6.44	-	3.600	-	no cap, ears broken off from side of vault, will not secure, water in vault
MW-22 SU	19-Jul-07	9:43	3.14	6.66	-	3.520	-	
MW-22 SL	19-Jul-07	9:48	2.99	6.59	-	3.600	-	water in vault, well under pressure
MW-24 SU	19-Jul-07	10:25	3.23	6.63	-	3.400	-	~3" product on top of water

Notes:

TOC - ft of casing

ft btoc - feet below top of casing

ft amsl - feet above mean sea level

TABLE C-7: JANUARY 2008 WATER LEVEL ELEVATIONS
Parris Island, South Carolina

Geosyntec Consultants

Well ID	Date	Time	Groundwater Level (ft btoc)	TOC Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Groundwater Elevation (ft amsl)	Groundwater Level (ft bgs)	Comments
PMW-1	15-Jan-08	11:10	2.84	6.77	7.09	3.930	3.16	
PMW-2	15-Jan-08	11:10	2.80	6.76	7.14	3.960	3.18	
PMW-3	15-Jan-08	11:10	2.89	6.79	7.14	3.900	3.24	
PMW-4	15-Jan-08	11:10	2.71	6.71	7.08	4.000	3.08	
PMW-5	15-Jan-08	11:10	2.77	6.75	7.17	3.980	3.19	
PMW-6	15-Jan-08	11:10	2.75	6.69	7.08	3.940	3.14	
MW-06 SU	15-Jan-08	9:15	3.15	6.65	-	3.500	-	
MW-06 SL	15-Jan-08	9:18	3.04	6.61	-	3.570	-	
MW-07 SU	15-Jan-08	10:00	2.78	6.80	-	4.020	-	
MW-07 SL	15-Jan-08	10:05	2.89	6.85	-	3.960	-	
MW-08 SU	15-Jan-08	10:15	2.50	6.74	-	4.240	-	
MW-08 SL	15-Jan-08	10:20	2.59	6.67	-	4.080	-	
MW-21 SU	15-Jan-08	10:30	2.61	6.53	-	3.920	-	vault full of fire ants
MW-21 SL	15-Jan-08	10:35	2.67	6.44	-	3.770	-	vault full of water; no ears on vault to secure cover/bolts
MW-22 SU	15-Jan-08	10:45	2.73	6.66	-	3.930	-	
MW-22 SL	15-Jan-08	10:50	2.53	6.59	-	4.060	-	
MW-24 SU	15-Jan-08	11:05	3.12	6.63	-	3.510	-	

Notes:

TOC - ftop of casing

ft btoc - feet below top of casing

ft amsl - feet above mean sea level

TABLE C-8: JULY 2008 WATER LEVEL ELEVATIONS
Parris Island, South Carolina

Geosyntec Consultants

Well ID	Date	Time	Groundwater Level (ft btoc)	TOC Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Groundwater Elevation (ft amsl)	Groundwater Level (ft bgs)	Comments
PMW-1	15-Jul-08	9:10	3.33	6.77	7.09	3.440	3.65	
PMW-2	15-Jul-08	9:05	3.38	6.76	7.14	3.380	3.76	
PMW-3	15-Jul-08	8:40	3.48	6.79	7.14	3.310	3.83	
PMW-4	15-Jul-08	8:45	3.41	6.71	7.08	3.300	3.78	
PMW-5	15-Jul-08	8:50	3.60	6.75	7.17	3.150	4.02	
PMW-6	15-Jul-08	8:56	3.58	6.69	7.08	3.110	3.97	
MW-06 SU	15-Jul-08	9:25	3.58	6.65	-	3.070	-	Product on top of water
MW-06 SL	15-Jul-08	9:30	3.48	6.61	-	3.130	-	Product on top of water
MW-07 SU	15-Jul-08	9:37	3.54	6.80	-	3.260	-	
MW-07 SL	15-Jul-08	9:40	3.53	6.85	-	3.320	-	
MW-08 SU	15-Jul-08	9:47	3.25	6.74	-	3.490	-	
MW-08 SL	15-Jul-08	9:51	3.18	6.67	-	3.490	-	
MW-21 SU	15-Jul-08	10:18	3.22	6.53	-	3.310	-	
MW-21 SL	15-Jul-08	10:14	3.02	6.44	-	3.420	-	
MW-22 SU	15-Jul-08	10:04	3.24	6.66	-	3.420	-	
MW-22 SL	15-Jul-08	10:08	3.21	6.59	-	3.380	-	
MW-24 SU	15-Jul-08	10:30	3.68	6.63	-	2.950	-	

Notes:

TOC - ftop of casing

ft btoc - feet below top of casing

ft amsl - feet above mean sea level

TABLE C-9: MARCH 2009 WATER LEVEL ELEVATIONS
Parris Island, South Carolina

Geosyntec Consultants

Well ID	Date	Time	Groundwater Level (ft btoc)	TOC Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Groundwater Elevation (ft amsl)	Groundwater Level (ft bgs)	Comments
PMW-1	3-Mar-09	9:40	2.82	6.77	7.09	3.950	3.14	
PMW-2	3-Mar-09	9:35	2.65	6.76	7.14	4.110	3.03	
PMW-3	3-Mar-09	8:55	2.71	6.79	7.14	4.080	3.06	
PMW-4	3-Mar-09	9:07	2.52	6.71	7.08	4.190	2.89	
PMW-5	3-Mar-09	9:15	3.10	6.75	7.17	3.650	3.52	Product noted on top of surface water in well
PMW-6	3-Mar-09	9:25	2.92	6.69	7.08	3.770	3.31	
MW-06 SU	3-Mar-09	10:20	2.94	6.65	-	3.710	-	water in vault
MW-06 SL	3-Mar-09	10:00	2.82	6.61	-	3.790	-	water in vault
MW-07 SU	3-Mar-09	10:45	2.84	6.80	-	3.960	-	vault filled with fire ants
MW-07 SL	3-Mar-09	10:50	2.84	6.85	-	4.010	-	
MW-08 SU	3-Mar-09	10:55	2.52	6.74	-	4.220	-	
MW-08 SL	3-Mar-09	11:00	2.54	6.67	-	4.130	-	
MW-21 SU	3-Mar-09	11:20	2.25	6.53	-	4.280	-	
MW-21 SL	3-Mar-09	11:30	2.10	6.44	-	4.340	-	water in vault
MW-22 SU	3-Mar-09	11:05	1.80	6.66	-	4.860	-	
MW-22 SL	3-Mar-09	11:15	1.90	6.59	-	4.690	-	water in vault
MW-24 SU	3-Mar-09	11:50	1.95	6.63	-	4.680	-	water in vault

Notes:

TOC - ft top of casing

ft btoc - feet below top of casing

ft amsl - feet above mean sea level

APPENDIX D

ADDITIONAL SAMPLING METHOD INFORMATION

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LIST OF ATTACHMENTS

Attachment 1:	Waterra® Pump System Information
Attachment 1:	Example Field Forms
Attachment 3:	Integral Pump Test Modeling

1. CALIBRATION OF FIELD ANALYTICAL EQUIPMENT

All field probes were calibrated prior to use using instrument manufacturer's directions. Calibration checks using known standard solutions of the analyte of interest were run as necessary during the day and at the end of each sampling session. All instrument calibration information was recorded in the field records. The pH meter (OAKTON pH 310; OAKTON Instruments, Vernon Hills, IL) was re-calibrated if the calibration drifted by ± 0.5 pH units. The DO (HI 9143, Hanna Instruments Inc., Woonsocket, RI), ORP (Orion 3-Star, Thermo Fisher Scientific Inc., Waltham, MA [used during groundwater sampling]; YSI 600XLM, YSI Inc., Yellow Springs, OH [used during post-injection ORP measurements]), and conductivity (WTW Cond 330, WTW Inc., Gold River, CA) meters were re-calibrated if the calibration drifted by greater than 20% of the standard concentration. The turbidity meter (Hach 2100P, Hach Company, Loveland, CO). Commercially prepared standard solutions were selected.

2. WATERRA® PUMP SYSTEM

The Waterra® pump system consisted of a Delrin® foot-valve attached to rigid, 5/8-inch outside diameter, high-density polyethylene (HDPE) tubing equal in length to the depth of the well. Oscillation of the tubing, together with the action of the foot valve, forced water to the ground surface (i.e., inertial pump). The entire pump assembly was dedicated to the well, reducing the potential for cross-contamination between wells. Attachment 1 contains information on the Waterra® pumps, including specifications and the results of studies conducted to evaluate sampling effectiveness of this system.

3. METHANOL EXTRACTION PROCEDURE FOR SOIL VOC SAMPLES

For soil samples that were analyzed for VOCs using the methanol extraction procedure, the sample was split along its length and about 200 to 300 grams (g) of wet soil sample was placed quickly into a pre-weighed 500 milliliter (mL) glass sample container. A small portion of the core was also placed into a separate glass container for laboratory moisture content measurements. Extreme care was taken to minimize disturbance of the soil sample so that loss of volatile components was minimal. Nitrile gloves were worn by field personnel whenever handling sample cores or tared sample containers. A modification of EPA SW846-Method 5035 was used to procure the cored samples in the field. Method 5035 lists different procedures for processing samples that are expected to contain low concentrations (0.5 to 200 $\mu\text{g/kg}$) or high concentrations (>200 $\mu\text{g/kg}$) of VOCs. Procedures for high levels of VOCs were used in the field because those procedures would facilitate the processing of large-volume sample cores collected during soil sampling activities.

Two sample collection options and corresponding sample purging procedures are described in Method 5035; however, the procedure chosen for this study was based on collecting

approximately 200 to 300 g of wet soil sample in a pre-weighed bottle that contains 250 mL of methanol. A modification of this method was used in the study as described by the following procedure:

- The 200 to 300 g wet soil sample was collected and placed in a pre-weighed 500 mL glass container. After capping, the container was reweighed to determine the wet weight of the soil. The container was then filled with 250 mL of reagent grade methanol. The container was then weighed a third time to determine the weight of the methanol added.
- After the container was filled with methanol and the soil sample, it was agitated by hand for approximately 10 minutes.
- After shaking, the container was re-weighed to ensure that no methanol was lost during the agitation period. The container was then placed upright and suspended soil matter was allowed to settle for at least 30 minutes.
- Following the settling period, methanol extract was decanted into glass VOA vials using disposable pipettes. The vials were then capped and labelled as described in Section 6, and stored in a cooler on ice at 4°C until they were shipped on ice to the analytical laboratory.
- The dry weight of each of the soil samples was determined by sending a subset of the core to the laboratory for moisture content analysis. The final concentrations of VOCs were calculated per the dry weight of the soil.

4. QUALITY ASSURANCE SAMPLING

4.1 Field QA/QC Controls

Field QA/QC samples consisting of trip blanks, matrix spike/matrix spike duplicate (MS/MSD) samples, and field duplicate samples were collected to monitor sampling and laboratory analytical performance with respect to groundwater samples. MS/MSD samples were prepared by the laboratory performing the analyses using field samples.

Trip blanks are sample bottles containing analyte-free, de-ionized water prepared at the contract laboratory and stored and shipped with the samples. The trip blanks were not opened in the field. Care was taken to ensure that the trip blank and sample bottles originated from the same shipment of bottles from the laboratory. Information obtained from the trip blank analyses was used to determine whether, and to what extent, sample handling and analysis introduced positive bias to the sample results. Trip blanks were only used for VOC analyses. One trip blank accompanied each cooler submitted with samples for VOC analyses.

Field duplicates were collected using the regular sampling procedures, and analyzed to evaluate the precision of the sampling and analysis system. Field duplicate samples submitted

for laboratory analyses were submitted without indication of which investigative sample the duplicate represents (i.e., blindly) and were analyzed for all geochemical parameters. Field duplicates were collected and analyzed at a frequency of one field duplicate for every twenty field samples, or for each sampling round.

Samples for MS/MSD analyses were prepared by laboratory personnel (using field samples) and analyzed to evaluate the effects of the sample matrix on the analytical results (i.e., assess bias). MS/MSD analyses were completed for VOCs at a frequency of one MS/MSD for every twenty field samples, or for each sampling round.

4.2 Other Controls

Field audits of groundwater sampling protocols were performed to ensure that procedures outlined in the Technology Demonstration Plan (Geosyntec, 2006) were followed. The audits included observations of sampling procedures and review of chain-of-custody (COC) documentation and sample results. These audits were conducted by the QA/QC Officer, or their designee, at the Site within the first month of initiating field activities. Following this period, daily audits of field activities and documentation were conducted via telephone or email during field activities. A data validation checklist was used to monitor field QA/QC procedures. Completed validation checklists are presented in Appendix G.

Sampling system failures were reported by the field personnel directly to the Field Study Leader-QA/QC Officer to specify the type of response action required, the method to evaluate effectiveness of the response action, and the methods for documenting the failure and response action implemented. The Field Leader-QA/QC Officer reviewed the cause of the failure and determined whether a future change to the sampling method was required.

5. DECONTAMINATION PRACTICES

5.1 Drilling Equipment

Drilling equipment was cleaned in a specified centralized cleaning area prior to initial use, between boreholes from separate test plots, and at the completion of drilling activities. The following items were thoroughly cleaned to remove foreign material:

- Drill casing, bits, and rods;
- Shovels and other tools that contacted subsurface materials; and
- Any other down-hole equipment.

5.2 Field Sampling Equipment

Non-dedicated sampling equipment (e.g., split-barrel samplers, peristaltic pumps, beakers) were manually cleaned prior to initial use, after each use, and at the completion of sampling activities according to the following procedure.

- Manually scrub with a phosphate-free (e.g., Alconox™) soap solution.
- Rinse with distilled water.
- Rinse with reagent-grade isopropanol.
- Rinse thoroughly with distilled water.
- Allow equipment to air dry.

5.3 Field Probes

The probes that were used for field measurements (e.g., DO, ORP, pH, conductivity, turbidity, and temperature) were cleaned before initial use and after each use by rinsing the probes thoroughly with distilled water. At the end of the day, the probes were cleaned according to the following procedure:

- Rinse thoroughly with distilled water.
- Blot dry with a clean paper towel.
- Store according to manufacturer's instructions.

5.4 Water Level Tapes

The water level tape was cleaned prior to initial use, after each use, and at the completion of measuring activities. If the water level tape was used to collect water level measurements, the probe and approximately 3 feet of the tape above the probe was cleaned. If the water level tape was used to plumb the bottom of a well, the entire length of tape that contacted water or other materials in the well was cleaned. Cleaning of the water level tape was completed using the procedures described above for field sampling equipment cleaning.

6. SAMPLE LABELLING, STORAGE, PACKAGING, AND TRANSPORTATION

All sample containers were labelled (using indelible ink pens) with the following information:

- Sample identifier (ID);

- Project name/ID;
- Name or initials of individual collecting the sample on field forms;
- Time and date of sample collection;
- Analysis to be performed; and
- Preservation chemical (if used).

Field duplicate samples required special procedures for sample designation to ensure that they were submitted blindly to the laboratory. A fictitious sample ID was used and a time was not indicated. Both the fictitious and actual information were documented in the field records.

Following sample collection, all samples were stored in an insulated cooler containing ice sealed in a plastic bag. Samples selected for laboratory analysis were transferred to insulated coolers for overnight shipment to the laboratory. Each cooler was carefully packed to avoid damage to the sample containers during shipment and contained ice to help maintain sample temperatures between approximately 0°C and 6°C.

A COC form accompanied each shipment and was used to trace the possession and handling of all samples from their collection, through analysis, until their final disposition. These forms documented the names of the relinquishing and receiving parties, and the time and date of the transfer of custody. The COC was placed in a sealed plastic bag inside the cooler. A custody seal was placed on each cooler after packing and prior to shipment. Shipping of samples to the laboratory was accomplished by Federal Express overnight service. Samples remained in the custody of the sampling team until custody was relinquished to Federal Express. Each sample shipment was tracked via the courier waybill number to ensure the prompt delivery of the shipment to the laboratory occurred.

Upon receipt by the Sample Custodian for the laboratory, the Sample Custodian recorded on the COC form whether the custody seal was intact, the cooler temperature, the presence of air bubbles in any of the groundwater samples submitted for VOCs analysis, any damaged sample containers or discrepancies between the sample label and information on the form, and their signature and date. A copy of the COC form was then transmitted to the Field Study Leader-Quality Assurance/Quality Control (QA/QC) Officer for their records and so that proper action could be taken, if necessary.

A summary of any and all non-conformances to the procedures discussed above is presented in Appendix G.

7. DATA RECORDING

Data generation was initiated in the field as personnel completed field forms. The field forms included observations about weather conditions at the Site during daily field activities, descriptions of soil cores, well construction details, results of field measurements and analyses, equipment calibration information, well pumping rates, depth-to-water measurements, date and time of purging and sampling, and the identification of samples collected.

The field forms were transmitted to the Field Study Leader-QA/QC Officer, who reviewed the forms for clarity, completeness, and conformity with the Technology Demonstration Plan (Geosyntec, 2006). Examples of field forms used during execution of this field demonstration are contained in Attachment 2.

8. INTEGRAL PUMP TEST MODELING

Prior to conducting the pre-injection IPT, a numerical groundwater flow model was developed to estimate the approximate limits of groundwater capture at the end of the IPT and to estimate the extent to which water that originates in the screens of each of the fully screened monitoring wells and multi-level wells will travel during the IPT. Model simulations were run using a pumping rate of 5 gallons per minute (gpm), as it was envisioned that this would be the pumping rate used in the field. A description of the model and results of the model simulations are presented in Attachment 3. Unfortunately, the maximum pumping rate achieved during the IPTs was approximately 1.25 gpm. Thus the model simulations were re-run using this lower pumping rate. Results of the model re-runs are presented in Figures D-1 and D-2 in Attachment 3.

9. REFERENCES

Geosyntec Consultants, Inc. (Geosyntec). 2006. Technology Demonstration Plan For: Emulsified Zero-Valent Nano-Scale Iron Treatment of Chlorinated Solvent DNAPL Source Areas. Prepared for Environmental Security & Technology Certification Program (ESTCP), Project ER-0431. June 15, 2006.

ATTACHMENT 1

WATERRA® PUMP SYSTEM INFORMATION

Downhole Components

Waterra produces a wide variety of downhole systems designed to suit many monitoring situations. The most popular system Waterra offers is the Standard System.

STANDARD SYSTEM: D-25 & 5/8" HDPE-100' (200')

Main Application: Developing, purging and sampling in 1.25", 1.5", 2" and 4" monitoring wells, this system cannot be combined with a surge block. May be hand operated or power driven

Flow Capacity: 0 - 1 gpm (0 - 6 L/min)

Lift Capacity: 135 feet (40 m) in 2" monitoring wells



STANDARD FOOT VALVE: MODEL D-25

Maximum OD: 1"

Length: 3"

Material: "Delrin" Acetal thermoplastic

Special Features: Self tapping female thread, durable, excellent resistance to organics, good silt handling capabilities

STANDARD TUBING: MODEL 5/8" HDPE-100' (200')

ID X OD: 1/2" X 5/8"

Length: 100' or 200'
(longer coils on request)

Material: 100% Virgin High Density Polyethylene (HDPE)

Special Features: High purity, excellent rigidity, no plasticizers

THE HIGH CAPACITY SYSTEM

In some situations higher flow rates or lifts greater than those supplied by the Standard System are needed. The High Capacity system was developed to address this need. The High Capacity System also has enhanced development capabilities, especially when combined with the SB-48 Surge Block.

HIGH CAPACITY SYSTEM: D-32 & 1" HDPE-100' (200') (300')

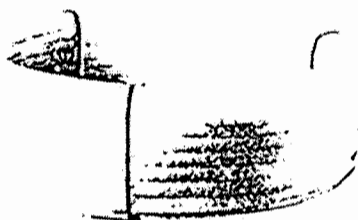
Main Application: Developing, purging and sampling in 2" and 4" monitoring wells. Can be combined with the SB-48 for well development. Usually requires a power actuator.

Flow Capacity: 0 - 4 gpm (0 - 20 L/min)

Lift Capacity: 300 feet (90 m) in 2" monitoring wells

waterra

Tubing Products



STANDARD TUBE

Product Model No.: 5/8"HDPE-100' (200')
Material: HDPE (High Density Polyethylene)
Dimensions: ID=0.5" OD=0.625" Length=100 feet or 200 feet
Suitable for use with: Standard System D-25
Miniature System D-16
Stainless Standard System SS-19
Stainless Miniature System SS-16

TEFLON STANDARD TUBE

Product Model No.: 5/8"FEP
Material: FEP (Flexible Teflon Tube)
Dimensions: ID=0.5" OD=0.625" Length is specified on order, minimum 25 feet
Suitable for use with: Standard System D-25
Miniature System D-16
Stainless Standard System SS-19
Stainless Miniature System SS-16

HIGH CAPACITY TUBE

Product Model No.: 1"HDPE-100' (200')
(300' Heavy Wall)
Material: HDPE (High Density Polyethylene)
Dimensions: ID=0.814" OD=1.0" Length=100 feet, 200 feet or 300 feet with ID=0.75"
Suitable for use with: High Capacity D-32
High Capacity D-32 with Surge Block

MINI II (13 MM) TUBE

Product Model No.: 1/2"HDPE-100'
Material: HDPE (High Density Polyethylene)
Dimensions: ID=.375" OD=.50"
Length=100 feet
Suitable for use with: D-13 or SS-13

MINI III (10 MM) TUBE

Product Model No.: 3/8"HDPE-100'
Material: HDPE (High Density Polyethylene)
Dimensions: ID=.170" OD=.375"
Length=100 feet
Suitable for use with: SS-10

waterra

Suitability of the Waterra Inertial Pump for Sample Acquisition

Questions regarding the suitability of the Waterra pump for use as a sampling device usually center on two areas of concern: 1) the recovery of volatiles and; 2) the loss of volatile organic compounds caused by sorption by pump materials.

THE RECOVERY OF VOLATILES

The recovery of volatiles during sampling was the subject of a paper published in the fall of 1988 in Ground Water Monitoring Review entitled "An Evaluation of Some Systems for Sampling Gas Charged Ground Water for Volatile Organic Analysis" by J.F. Barker and R. Dickhout.

This study compared the recovery of methane-charged ground water for volatile aromatic hydrocarbons and CO₂ charged reservoir water for volatile chlorinated hydrocarbons when sampled by various methods. Samples were taken with a positive displacement bladder pump, the Waterra Inertial Pump and a suction lift peristaltic pump.

In the field experiment, the suction lift pump produced significant negative bias (9 to 33%) relative to the other methods. There was little difference noted between the samples of methane charged ground water taken by the bladder pump and the Waterra pump.

In the laboratory experiment, the Waterra pump produced samples that were consistently higher (13 to 19%) in halocarbon concentration than those collected with the bladder pump. Given that bladder pumps are widely recognised as suitable for sampling volatiles, this study indicated that the Waterra Pump is equally, and in some cases better, suited to the task.

RECENT WATERRA EVALUATIONS

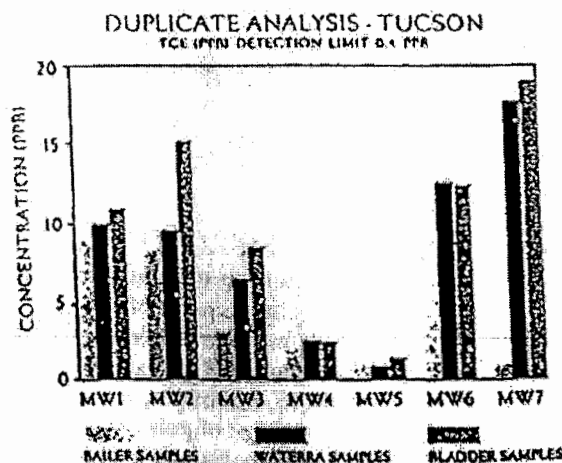
New studies have been completed recently evaluating the effectiveness of the Waterra Inertial Pump as a sampling device for the collection of VOC samples. These new studies compare samples collected with standard

"Delrin" and HDPE Waterra equipment to samples collected with both Teflon and stainless steel bladder pumps and Teflon bailers.

WATERRA-BLADDER PUMP COMPARISONS

Seven wells in Tucson, Arizona were sampled with the three devices mentioned above. This comparison provided a rigorous test for the Waterra pump as levels of contamination were very low (1 to 20 ppb TCE).

The results of the sampling can be compared using standard QA/QC methods for evaluating the accuracy of duplicate samples as outlined in the American Public Health Association (APHA) 1989 publication "Standard Methods For The Examination Of Water And Waste." Using this method, all of the 7 Waterra samples were determined to be "high precision" duplicates of the bladder pump samples. Five of the 7 bailer samples were found to be high precision duplicates of the bladder pump samples.



Considering the low concentrations and that the QA/QC method is normally used for comparing duplicates collected with the same device, it seems that the Waterra Inertial Pump is a highly accurate sampling device when compared with the bladder pump. This comparison also shows that the use of alternative materials such as high density polyethylene and Delrin do not have an effect on sample accuracy.

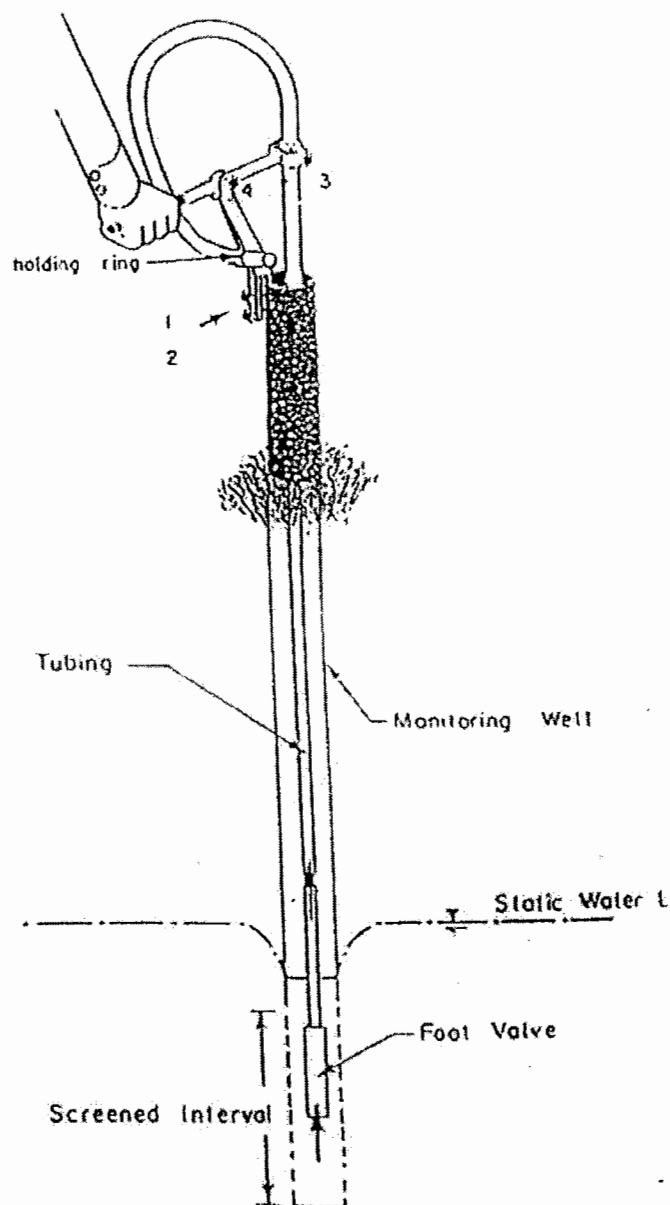
waterra

INSTALLATION AND OPERATION OF THE WATERRA HAND PUMP

Attach the foot valve to the plastic tubing by threading the foot valve clockwise (right hand thread) onto the tubing for a distance of about 1/2 inch. The threads on the foot valve will self-tap into the plastic tubing to provide a strong water tight connection. Test the connection by pulling vigorously on the foot valve.

1. Lower the foot valve and tubing to the desired depth and cut the tube approximately 1.2 metres above the top of the well casing.
3. Fasten the handle onto the well casing or surface protective casing as shown in diagram by tightening knob 1 and knob 2.
4. Attach tubing to the clamp (knob 3) on the end of the handle with about 1.2 metres of tubing extending above the clamp. Insert the top end of this tube through the holding ring (see diagram). This will give you a fixed spout to facilitate the collection of water samples.
5. Adjust position of pivot point (knob 4) so that the tube hangs clear of the well casing wall.
6. Pump water from the well by operating handle at a rate of about 90 to 120 strokes per minute. To maximize pumping rate, sharp "snap-like" strokes should be used to impart greater upward momentum to the column of water.
7. The pump can also be operated by hand (without the handle) by rapidly stroking the tube up and down over a distance of about 40 cm (15 inches) at a rate of over 90 strokes per minute.

The pump will lift water laden with silt and sand, however, after pumping is completed, the sediment in the column of water within the tube will settle out and may clog the foot valve. To prevent this, we recommend clearing the tube after use. This is easily accomplished by air lifting the silty water out of the tube using a small diameter air line and bicycle hand pump. Alternatively the tube may be pulled to the surface and drained.



WATERRA-TEFLON BAILER COMPARISONS

In addition to the duplicate samples collected in Tucson, a further 18 monitoring wells were sampled with Teflon bailers and Delrin and polyethylene Waterra equipment in Kansas City, Kansas. In most cases the Waterra pump and the bailer samples showed very good correlation, being high precision duplicates. Exceptions were noted however in wells with higher concentrations of contaminants. In these wells the Waterra Inertial Pump consistently produced samples with significantly higher levels of contaminants, usually 30% to 150% higher.

It is well known that samples containing high levels of volatiles are more susceptible to volatilization losses. Because Waterra pump samples from the more severely contaminated wells contained higher levels of contaminant it seems that it is better suited for the collection of these samples.

CONCLUSIONS

This work further supports the use of the Waterra Inertial pump as a sampling device for VOC's. When compared to currently accepted systems such as Teflon bailers and stainless and Teflon bladder pumps, the Waterra Inertial Pump proved equivalent and often better suited to the task.

EFFECTS OF PUMP MATERIALS

There have been numerous papers published which discuss the sorption of volatile organic compounds by polymer materials commonly used in pumps. These studies show that a critical factor in determining sorption losses, apart from the type of polymer and type of organic compound concerned, is the exposure time. Few papers have attempted to put this sorption data into perspective, i.e. what percent loss can be expected in a sampling event. Fortunately some practical information is available from a paper entitled "Sample Tubing

DUPLICATE SAMPLES KANSAS CITY, KANSAS

WELL#	TCE (ppb)		DCE (ppb)		VINYL CHLORIDE (ppb)	
	BAILER W/P	WATERA W/P	BAILER W/P	WATERA W/P	BAILER W/P	WATERA W/P
1130	27	31	72	63	51	45
1131	0	0	62	61	28	28
1132	0	0	109	111	51	58
1133	62	60	306	430	67	71
1134	61	60	1000	1500	84	86
1135	76	114	990	1200	47	51
68-1	8	8	34	28	12	12
40-1	0	0	14	14	0	0
43-1	51	46	120	116	0	0
10-6	13	12	62	73	0	0
24	0	0	17	19	11	16
81-1	0	0	18	14	0	0
95-1	48	100	570	2000	89	280
12-1	0	0	136	240	6	6
12-2	5	0	15	29	0	0
13-1	54	61	40	40	0	12
150-1	0	0	0	0	0	0
35-1	0	0	0	0	0	0

*W.P. = Waterra Inertial Pump

Effects on Groundwater Samples" by M.J. Barcelona et al, published in Analytical Chemistry by the American Chemical Society, 1985. Barcelona calculated the percent sorptive loss to tubing for a 40 ppb mixture of chloroform, trichloromethylene, tetrachloroethane and tetrachloroethylene when passed through 15 meters (49.2 feet) of 1/2 inch ID tubing at a rate of 100 mL per minute (0.026 gpm). Barcelona found that the predicted loss due to sorption by polyethylene was small and virtually identical to that calculated for teflon, both 1%.

For comparison, it may also be worth remembering that the typical flow generated by hand operation of the Waterra Standard System is usually about 1 gpm, 50 times the flow rate used in Barcelona's predictions. It is reasonable to assume that a higher flow rate will result in less loss due to sorption because of the reduced exposure time. Therefore it appears that the use of inexpensive plastic materials such as polyethylene does not introduce any significant negative bias in typical sampling events.

waterra

Waterra Pumps Ltd. 77 Mowat Avenue, Suite 101, Toronto Ontario M6K 3E1 Canada (416) 536-1236 U.S.A. (716) 835-3921

ATTACHMENT 2
EXAMPLE FIELD FORMS

DAILY FIELD REPORT

Project Name: _____	Date: _____ Page ____ of ____
Project Number: _____	Primary Activities: _____
Field Personnel: _____ _____	_____ _____
Recorded By: _____	_____
Weather: _____	

[illegible]

HEALTH & SAFETY TAILGATE MEETING

Division/Subsidiary _____ Facility _____
Date _____ Time _____ Job Number _____
Customer _____ Address _____
Specific Location _____
Type Work _____
Chemicals Used _____

Safety Topics Presented

Protective Clothing / Equipment _____

Chemical Hazards _____

Physical Hazards _____

Emergency Procedures _____

Hospital / Clinic _____ Phone () _____ Paramedic Phone () _____
Hospital Address _____
Special Equipment _____
Other _____

Attendees

Name Printed

Signature

Meeting Conducted By

Name Printed

Signature

Supervisor _____

Manager _____

SAMPLE/CORE LOG OF BORING

Borehole ID _____	Drilling Started (time/date) _____	Page ____ of ____
Project Name _____	Drilling Completed _____	
Project Number _____	Total Depth Drilled _____ m/ft	Hole diameter _____ cm/in
Site Location _____	Sampling Interval _____ m/ft	
Drilling Contractor _____	Type of Sample/Coring Device _____	
Driller _____	Ground Surface Elevation _____ m	<input type="checkbox"/> surveyed <input type="checkbox"/> estimated
Drilling Method _____	Drilling Fluid Used _____	
Field Personnel _____	Decontamination Method _____	
Recorded By _____	Hammer Weight _____	Hammer Drop _____ cm/inches

[illegible]

WELL CONSTRUCTION

Well ID _____ Site Location _____
Project Name _____ Field Personnel _____
Project Number _____ Recorded By _____

Permit Number _____
Installation Date(s) _____
Drilling Method _____
Borehole Diameter _____
Drilling Contractor _____
Driller _____
Drilling Fluid _____
Fluid Loss During Drilling _____ Litres/Gallons

Materials Used

Riser Pipe: Diameter _____ cm/inches
Construction
☐ PVC schedule _____
☐ Stainless Steel
☐ Other _____

Slotted Area: Length _____ ft/m
Diameter _____ cm/inches
Slot Size _____ cm/inches
Construction
☐ PVC schedule _____
☐ Stainless Steel
☐ Other _____

Silt Trap Used ☐ Yes ☐ No

Bottom End Cap: ☐ Male ☐ Female ☐ Slip
☐ PVC
☐ Stainless Steel
☐ Other _____

Top Cap: ☐ Male ☐ Female ☐ Slip ☐ J Plug
☐ PVC
☐ Stainless Steel
☐ Other _____

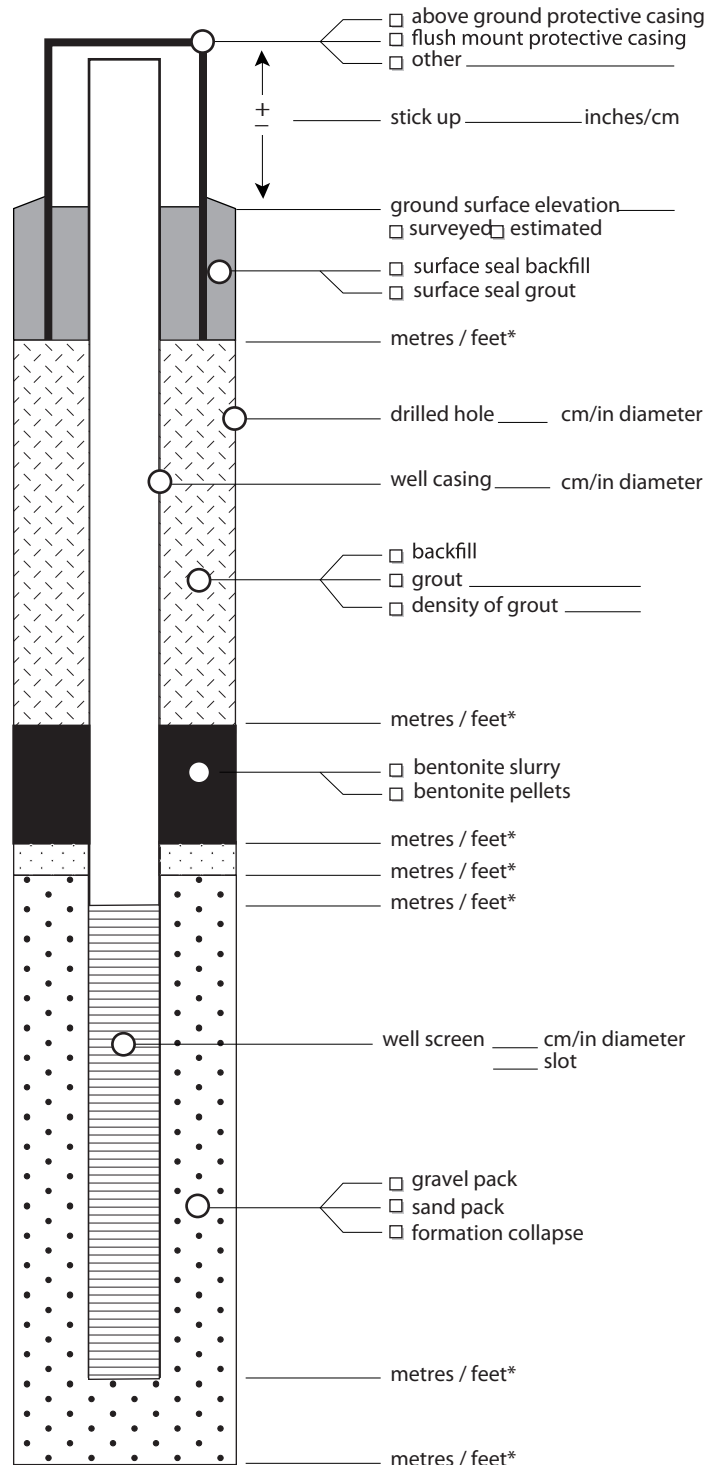
Protective Casing: Length _____ ft/m
Diameter _____ cm/inches
Construction ☐ Cast Aluminum
☐ Cast Steel
☐ Other _____

Casing Installation: Length _____ metres/feet
Diameter _____ cm/inches
Material _____

Sandpack:
Coarse Sand: _____ bags of _____ kg/lb per bag Size _____
Fine Sand: _____ bags of _____ kg/lb per bag Size _____

Seal:
Bentonite Pellets: _____ bags of _____ kg/lb per bag Type _____
Bentonite Slurry: _____ bags of _____ kg/lb per bag Type _____

Grout:
Cement: _____ bags of _____ kg/lb per bag Type _____
Bentonite: _____ bags of _____ kg/lb per bag Type _____



Measuring Point is Top of Well Casing
Unless Otherwise Noted

* Depth Below Ground Surface

MULTI-LEVEL WELL CONSTRUCTION

Well ID _____	Site Location _____
Project Name _____	Field Personnel _____
Project Number _____	Recorded By _____

Permit Number _____	Drilling Contractor _____
Installation Date(s) _____	Driller _____
Drilling Method _____	Drilling Fluid _____
Borehole Diameter _____	Fluid Loss During Drilling _____ Litres/Gallons

Materials Used

CMT Tubing

Diameter _____ cm/inches

Material _____

Screened Ports:

Length _____ ft/m

Diameter _____ cm/inches

Screen Size _____ cm/inches

Screen Material _____

Silt Trap Used ☐ Yes ☐ No

Bottom Screened Port:

Length _____ ft/m

Diameter _____ cm/inches

Screen Size _____ cm/inches

Screen Material _____

Silt Trap Used ☐ Yes ☐ No

Top Cap:

☐ Male ☐ Female ☐ Slip ☐ J Plug

☐ PVC

☐ Stainless Steel

☐ Other _____

Protective Casing:

Length _____ ft/m

Diameter _____ cm/inches

Construction ☐ Cast Aluminum

☐ Cast Steel

☐ Other _____

Casing Installation:

Length _____ metres/feet

Diameter _____ cm/inches

Material _____

Sandpacks:

Coarse Sand: _____ bags of _____ kg/lb /bag

Fine Sand: _____ bags of _____ kg/lb /bag

Coarse Sand: Size _____

Fine Sand: Size _____

Seals:

Bentonite Pellets: _____ bags of _____ kg/lb per bag

Bentonite Slurry: _____ bags of _____ kg/lb per bag

Bentonite Pellets: Type _____

Bentonite Slurry: Type _____

Grout:

Cement: _____ bags of _____ kg/lb per bag

Bentonite: _____ bags of _____ kg/lb per bag

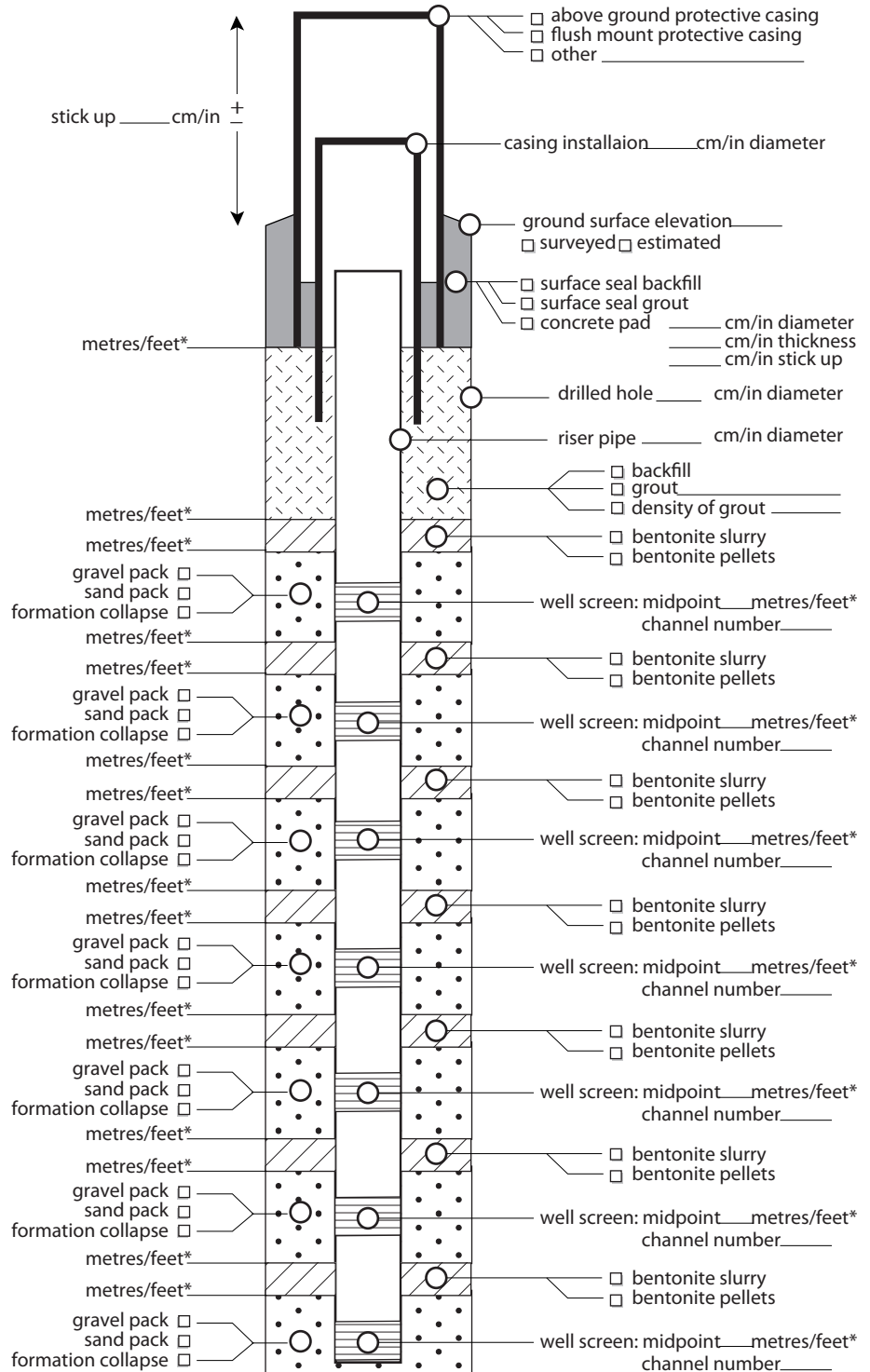
Cement: Type _____

Bentonite: Type _____

Concrete Pad:

Cement: _____ bags of _____ kg/lb per bag

Cement: Type _____



Measuring Point is Top of Well Casing Unless Otherwise Noted

* Depth Below Ground Surface

METER CALIBRATION REPORT

Project Name: _____

Date: _____ Page 1 of 1

Project Number: _____

Primary Activities: _____

Field Personnel: _____

Recorded By: _____

Weather: _____

Start of Sampling Event Calibration Completed at: _____ (time)

End of Sampling Event Calibration Check Completed at: _____ (time)

pH calibration		buffer solution		
		pH 4.0	pH 7.0	pH 10.0
Start Day	temp. (°C)			
	instrument reading			
	should read/calibrated to			
End Day	temp. (°C)			
	instrument reading			

ORP calibration		Zobell solution (+231 mv Zobell reads:)
Start Day	temp. (°C)	
	instrument reading	
	should read/calibrated to	
End Day	temp. (°C)	
	instrument reading	

°C	-5	0	5	10	15	20	25	30	35	40	45
°F	23	32	41	50	59	68	77	86	95	104	113
Zobell Solution (mv)	270	263.5	257	250.5	244	237.5	231	244.5	218	211.5	205

specific conductance calibration		Calibration standard	
Calibration Std _____ (µS / cm)		(µS / cm)	°C
Start Day	temp. (°C)		
	instrument reading		
	should read/calibrated to		
End Day	temp. (°C)		
	instrument reading		

dissolved oxygen calibration		100%	0%
Start Day	temp. (°C)		
	instrument reading		
	should read/calibrated to		
End Day	temp. (°C)		
	instrument reading		

Turbidity calibration		Standard (NTU)
Start Day	instrument reading	
End Day	instrument reading	

Meter Summary

pH Meter / Probe:

Model:

DO Meter / Probe:

Model:

ORP Meter / Probe:

Model:

Conductivity Meter / Probe:

Model:

Turbidity Meter / Probe:

Model:

Comments: (rental, condition, problems)

MONITORING WELL DEVELOPMENT PURGING & SAMPLING RECORDS

Well ID: _____ Well Diameter: _____

Project Name: _____ Total Depth of Well: _____

Project Number: _____ Initial Depth to Water: _____ Time: _____

Date: _____ Casing Volume: _____

Recorded By: _____ Depth to Water After Purging: _____ Time: _____

Sample ID: _____ Method of Purging: _____

Duplicate ID: _____ Method of Sampling: _____

Weather: _____

[illegible][illegible]

Notes: (well condition, nearby activities or changes in land use, odors, problems, deviations from plan, etc.)

Monitoring Well Purging & Sampling

Phone: (519) 822-2230
Fax: (519) 822-3151

RECORDED BY: _____

[illegible]

density water:	1
density MeOH	0.79

ATTACHMENT 3

INTEGRAL PUMP TEST MODELING



MEMORANDUM

TO: Drs. Andrea Leeson and Rajat Ghosh, ESTCP
FROM: Suzanne O'Hara, Project Manager
DATE: September 18, 2006
SUBJECT: Integral Pump Test Modeling
REFERENCE: ER-0431 – EZVI at Parris Island

GeoSyntec Consultants (GeoSyntec) developed a numerical groundwater flow model (the model) to determine the degree of water displacement associated with the Integral Pump Test (IPT) to be conducted at the Parris Island Site (the Site). This memorandum describes the development and use of the model.

1. MODELING OBJECTIVES

The objectives of this numerical model are to:

1. Estimate the approximate limits of groundwater capture at the end of 16 hours of the operation of the pump test; and
2. Estimate the extent to which water that originates in the screens of each of the performance monitoring wells (PMWs) and multi-level wells (MLs) will travel during the 16 hours of the operation of the pump test.

2. MODEL DESCRIPTION

Numerical Codes, Assumptions and Limitations

Groundwater flow and particle tracking were simulated using MODFLOW and MODPATH, which are both industry standard modeling codes developed by the United States Geological Survey. The software implementation (i.e., graphical user interface) used for these codes was Visual MODFLOW™, Version 4.0, developed and marketed by Waterloo Hydrogeologic Software, Ltd.

The model constructed for the site simulates saturated, transient or steady-state flow with uniform density and temperature, and spatially-varying anisotropic hydraulic properties within nine model layers.

Model development was conducted for the sole purpose of the currently intended model objectives stated in Section 2. Therefore, the model should be used to simulate conditions in the immediate vicinity of the PMWs and MLs included in the model. The model boundary condition were implemented to simulate the hydraulic gradient observed in the field, but has not been calibrated to observed water levels.

The validity and applicability of the model for purposes other than the stated objectives must be independently evaluated based on the professional judgment of the model user.

Domain and Boundaries

The model domain encompasses the Pilot Test Area with model boundaries located far enough from the area of interest to avoid significant boundary effects.

The domain is built using model and world coordinates georeferenced to the Louisiana South State Plane system (North American Datum of 1983) for easy integration with well survey data and a site geographical information system (GIS) database.

The model domain encompasses 600 feet northing and 600 feet easting for a total area of 360,000 ft² (8.3 acres). The model grid is oriented 45 degrees to compass coordinates to align with the principal direction of groundwater flow (southeast). The top (northwest) and bottom (southeast) boundaries of the model were assigned constant head values to impose a regional horizontal gradient of 0.01 feet per foot throughout the model domain. No other boundary conditions were imposed on the model.

The model has nine active layers, designed to simulate the 7 distinct lithological facies observed in borehole SC-8 (Attachment 1), considered to be representative of the lithology in the vicinity of the pump test. The top facies and the second from bottom facies are divided into two layers such that the pumping well (PMW-3) extends between layer contacts. Hydraulic conductivities were assigned to the four observed facies (sand, silty sand, clay, and peat) based on literature values (1×10^{-1} , 1×10^{-2} , 1×10^{-5} , and 1×10^{-4} cm/s respectively). A horizontal to vertical anisotropy ratio of 100:1 was simulated in each layer. An effective porosity of 0.25 was simulated across the model domain.

Each layer contains 28,960 cells, ranging in area from 6 ft by 6ft near the model boundaries and down to 0.85 ft by 0.8 ft in the vicinity of the PMWs and MLs.

Solution Techniques

The groundwater flow equation was solved using the Bi-Conjugate Gradient Stabilized (Bi-CGSTAB) method with a residual convergence criterion of 0.01 ft and a head change criterion of 0.01 ft. The model ran smoothly without any indications of numerical dispersion.

3. MODEL SIMULATIONS

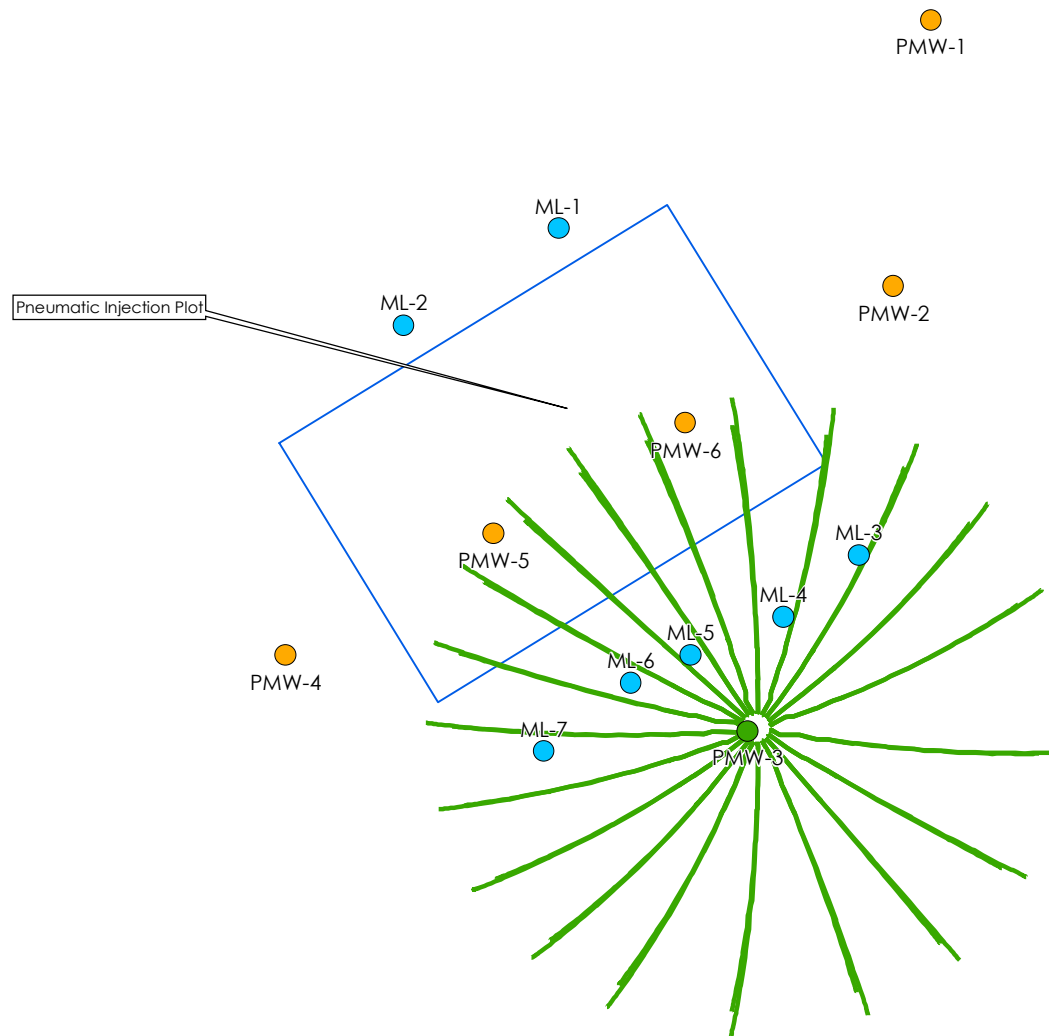
The model was run in a steady-state mode with no pumping to establish an array of initial heads, and then in transient mode (over the period of one year) with time steps set at the end of 16 hours of pumping. Backward tracking particles were released from the well screen of the pumping well to achieve the first model objective, and forward tracking particles were released within the well screens on the PMWs and MLs to achieve the second model objective. The results of the simulation are shown in Figures 1 and 2. It should be noted that the bulk of the flow shown on the figures occurs in the sand layers. The particles shown for the multilevel wells are from the 14 foot below ground surface screen interval which is the sand interval containing the highest levels of contaminant measured at the site.

4. CONCLUSIONS

The model indicates that capture zone for the IPT is mainly centered on the area directly downgradient of the Pilot Test Area as designed to evaluate the changes in mass flux out of the treatment area. The plan is to collect additional groundwater samples from a subset of the wells after the IPT and prior to the injection of EZVI. The samples would be collected from the 14 foot depth interval from ML1, ML-2, ML-3, ML-5 and ML-7 as well as PMW-5 and PMW-6. We will not have the data back prior to the injection of EZVI but we would have the data to help determine if any changes in groundwater concentrations occurred due to the pumping. We are also planning on monitoring PMW-4, PMW-5, PMW-6 and PMW-2 during the IPT with pressure transducers which will give us some idea of the extent of the zone of influence of the IPT.

* * * * *

Enclosures: Figure 1. Capture at pumped well following 16 hours of extraction
Figure 2. Particle tracking from PMWs and MLs following 16 hours of extraction
Attachment 1. Representative Borehole Log



- Monitoring Well (single screen)
- Monitoring Well (multi-level)
- Pumping Well
- Particle Tracks (capture by pumping well)

0 10 20 Feet

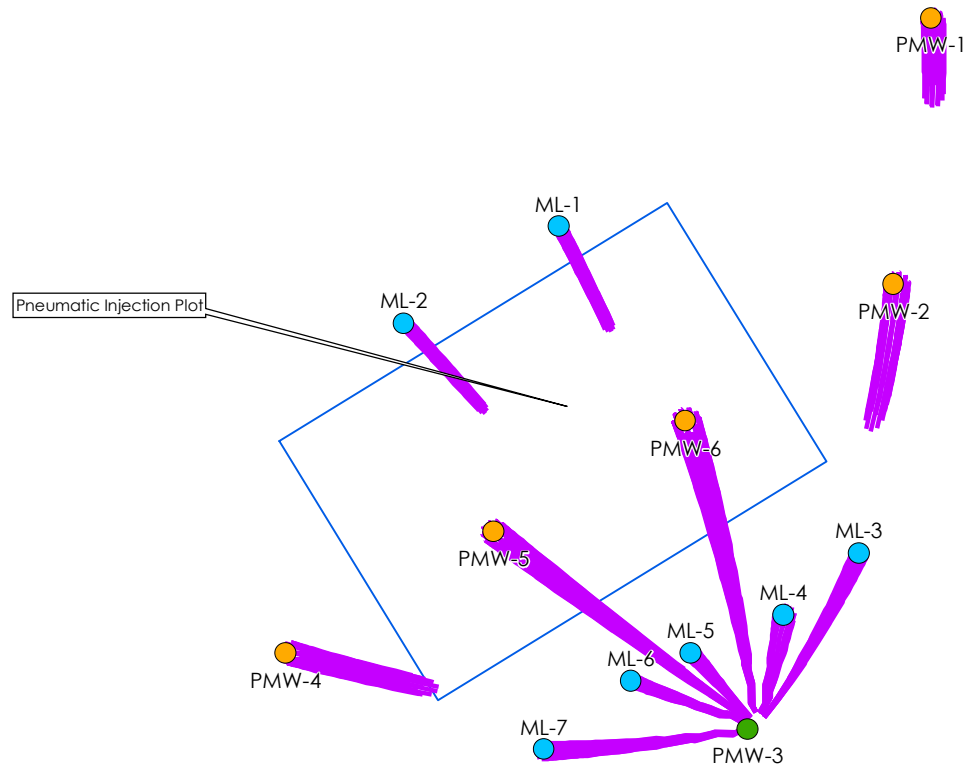


**Capture at Pumped Well Following
16 Hours of Extraction**
Integral Pump Test

15-Sep-06

Figure: 1





- Monitoring Well (single screen)
- Monitoring Well (multi-level)
- Pumping Well
- Particle Tracks (flow from monitoring wells)

0 10 20 Feet



**Particle Tracking From PMWs and MLs
Following 16 Hours of Extraction**
Integral Pump Test

15-Sep-06

Figure: 2





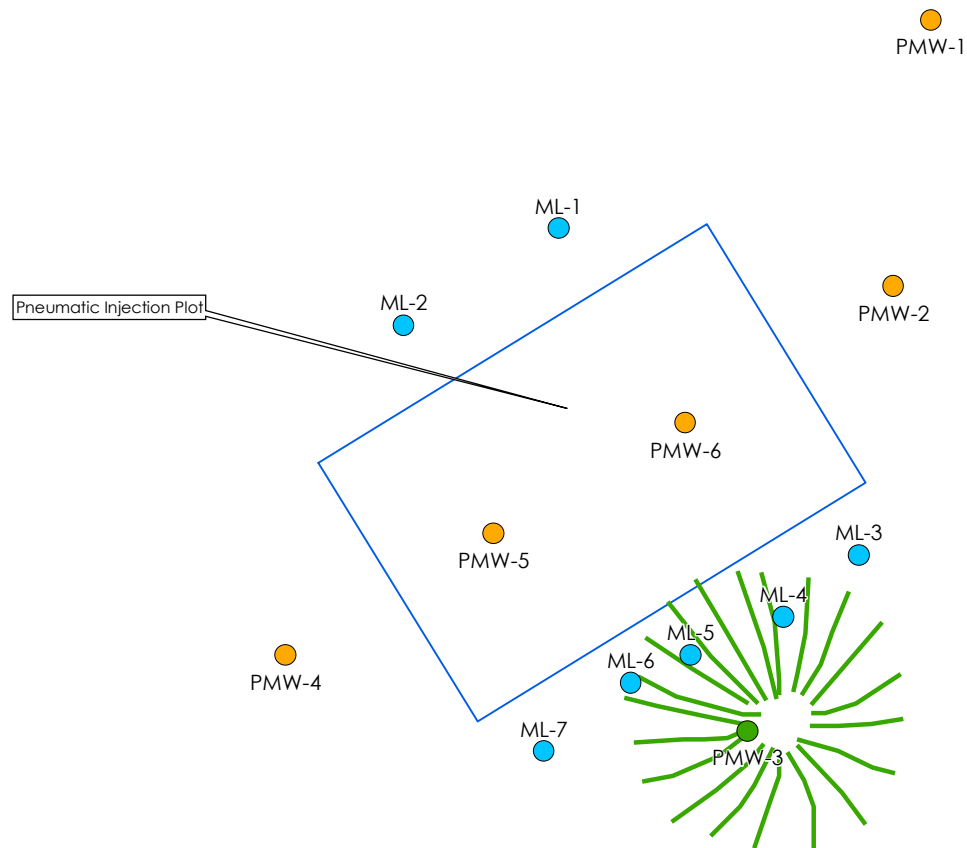
Borehole No. SC-8

Page 1 of 1

Borehole Log

Project No.: TR0173	Location: Site/SWMU 45 Marine Corps Recruit Depot Parris Island, SC
Client: ESTCP	Coordinates:
Geologist: S. O'Hara	Drilling Method: Direct Push - butyrate liners
Drilling Company: EPA - B. Scroggins	Well Material: NA
Completion Date: 15 June 2005	Borehole Diameter: 1 inch
	Site Datum:

Depth			Stratigraphy	Lithologic Description	Geologic Samples			Comments
Depth, feet	Depth, metres	Water Level			Unified Soil Classification	Recovery, %	Soil Sample ID	
1				no recovery				
2						NA	NA	
3	1							
4				clayey sand, fine to medium grained, dark grey, strong organic odour	SC			
5				sand, light grey, strong organic odour, trace silt and clay lenses	SP	85	SC-8-6	
6				brown lenses				
7	2			sandy clay lenses		100	SC-8-8	
8				red-brown mottling				
9				black banding	CL			
10				clay, stiff, plastic, light grey, organic odour				
11				clay, stiff, plastic, light grey, organic odour	CLM	100	SC-8-10	
12	3			silty/clayey sand, dark grey, sheen	SPMC			
13				strong odour		100	SC-8-12	
14				sand, fine to medium grained, sugary texture, dark grey	SW			
15				higher silt content		100	SC-8-14	
16	4					100	SC-8-16	
17						100	SC-8-18	
18	5			clay, firm, plastic, dark grey	CL	90	SC-8-18	
19				peat, dark brown, wood pieces	PT	100	SC-8-20	
20	6			clay, dark grey	CL			
21				Borehole depth 20.0 ft				Notes:
22								NA - not available
23	7							
24								



Pumping well operating at 1.25 gallons per minute

- Monitoring Well (single screen)
- Monitoring Well (multi-level)
- Pumping Well
- Particle Tracks (capture by pumping well)

0 10 20 Feet

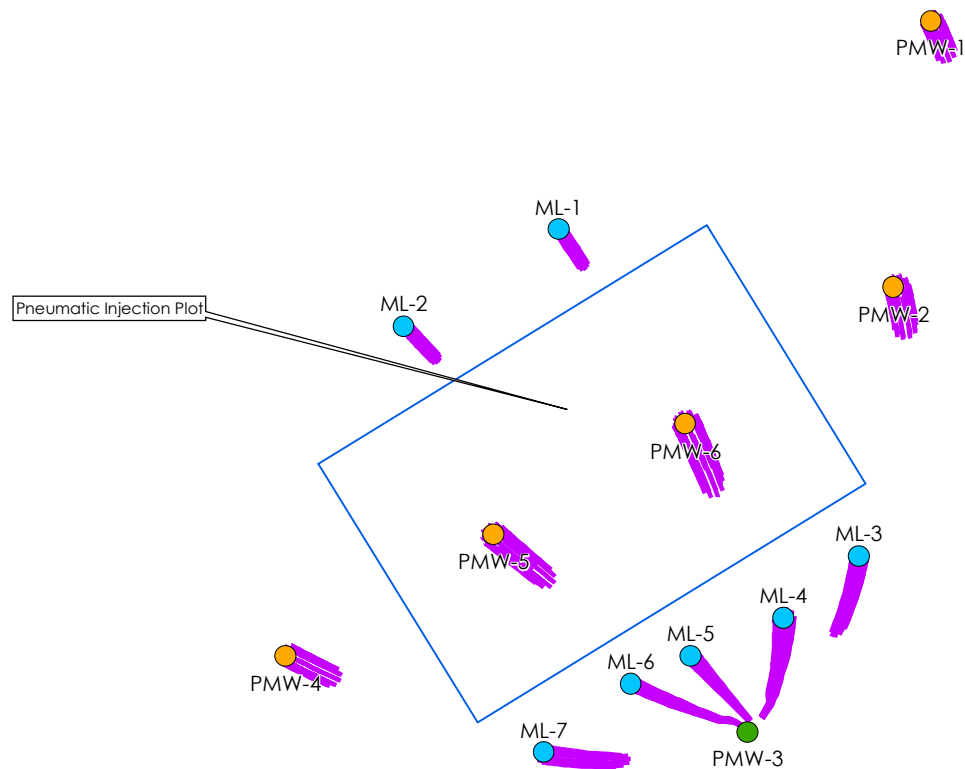


**Capture at Pumped Well
Following 16 Hours of Extraction**
Integral Pump Test

18-Oct-06

Figure: D-1





Pumping well operating at 1.25 gallons per minute

- Monitoring Well (single screen)
- Monitoring Well (multi-level)
- Pumping Well
- Particle Tracks (flow from monitoring wells)

0 10 20 Feet



**Particle Tracking From PMWs and MLs
Following 16 Hours of Extraction**
Integral Pump Test

17-Oct-06

Figure: **D-2**



APPENDIX E

ANALYTICAL DATA AND CALCULATION SUMMARIES

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**TABLE E-1: GROUNDWATER VOC CONCENTRATIONS FROM TEMPORARY WELLS
Parris Island, South Carolina**

Geosyntec Consultants

Location	Depth of Sample (ft)	Date Sampled	Duplicate	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)
AW-2		12-Jun-05	--	428	352	1900	28.1 J
MW-08SU		12-Jun-05	--	18500	5390	2740	200 U
MW-22SU		12-Jun-05	--	200 U	204	10300	3080
TW-1	8	11-Jun-05	--	8410	28700	68400	13300
	15	11-Jun-05	--	114	338	104	7.5
	20	11-Jun-05	--	2.51	6.78	12.6	6.13
TW-2	8	12-Jun-05	--	52500	37500	28700	1960
	15	12-Jun-05	--	71400	2620	555 J	1000 U
	20	12-Jun-05	--	6720	131	100 U	100 U
TW-3	8	12-Jun-05	--	61.8	0.914 J	85.3	17
	15	12-Jun-05	--	19.4	0.787 J	43.7	1.66
	15	12-Jun-05	Field Duplicate	20.8	0.718 J	50.2	2.17
TW-4	8	12-Jun-05	--	11900	6700	5590	200 U
	15	12-Jun-05	--	8750	440	200 U	3.41
	19	12-Jun-05	--	180	35.9	29.3	11.3

Notes:

ft - feet

µg/L - micrograms per liter

"J" - estimated concentration

"U" - not detected (reported at detection limit)

TABLE E-2: SC-9 SOIL PROPERTIES
Parris Island, South Carolina

Geosyntec Consultants

Sample ID	Soil Lithology	Date Sampled	Duplicate	Porosity (%)	Density (g/cm ³)	foc (mg/kg)
SC9C	clay	21-Jun-06	--	62.5	0.98	45000
SC9P	peat	21-Jun-06	--	84.4	0.3	250000
SC9S	sand	21-Jun-06	--	28.1	1.55	880
SC9S	sand	21-Jun-06	Duplicate	--	--	1110

Notes:

-- - not collected/analyzed

g/cm³ - grams per cubic centimeter

mg/kg - milligrams per kilogram

TABLE E-3: VOC CONCENTRATIONS FROM SOIL SAMPLES
Parris Island, South Carolina

Geosyntec Consultants

Location	Sample Depth (ft)	Date Sampled	Duplicate	Dominant Lithology	Ct (max) (µg/kg)	Tetrachloroethene (µg/kg)	Trichloroethene (µg/kg)	trans-1,2-Dichloroethene (µg/kg)	1,1-DCE (µg/kg)	cis-1,2-DCE (µg/kg)	Vinyl chloride (µg/kg)
SC-1	4-6	13-Jun-05	--	sand	118,486	6,100	890	310 U	310 U	810	610 U
	6-8	13-Jun-05	--	silty sand	118,486	140,000	4,200	2400 U	2400 U	2400 U	4800 U
	6-8	13-Jun-05	Field Duplicate	silty sand	118,486	130,000	3,900	2400 U	2400 U	2400 U	4800 U
	8-10	--	--	sand (assumed)	118,486	--	--	--	--	--	--
	10-12	13-Jun-05	--	sand	118,486	7,700	750	340 U	340 U	340 U	690 U
	12-14	13-Jun-05	--	sand	118,486	330 U	330 U	330 U	330 U	330 U	650 U
	14-16	13-Jun-05	--	sand	118,486	320 U	320 U	320 U	320 U	320 U	630 U
	16-18	13-Jun-05	--	sand and clay	2,293,690	300 U	300 U	300 U	300 U	300 U	600 U
	18-20	13-Jun-05	--	peat	38,535,200	1300 U	1300 U	1300 U	1300 U	1300 U	2600 U
	4-6	13-Jun-05	--	sand	118,486	290 U	290 U	290 U	290 U	290 U	590 U
SC-2	6-8	13-Jun-05	--	silty sand	118,486	1200 U	1200 U	1200 U	1200 U	1200 U	2500 U
	8-10	13-Jun-05	--	silty clay	4,980,661	350 U	350 U	350 U	350 U	350 U	700 U
	10-12	13-Jun-05	--	silty clay	4,980,661	340 U	340 U	340 U	340 U	340 U	690 U
	12-14	13-Jun-05	--	silty sand	118,486	350 U	350 U	350 U	350 U	350 U	700 U
	14-16	13-Jun-05	--	sand	118,486	340 U	340 U	340 U	340 U	340 U	690 U
	16-18	13-Jun-05	--	sand	118,486	400 U	400 U	400 U	400 U	400 U	810 U
	18-20	13-Jun-05	--	peat	38,535,200	670 U	670 U	670 U	670 U	670 U	1300 U
	18-20	13-Jun-05	Field Duplicate	peat	38,535,200	670 U	670 U	670 U	670 U	670 U	1300 U
	4-6	13-Jun-05	--	sand	118,486	70,000	2,500	2,100	1500 U	49,000	2900 U
	6-8	13-Jun-05	--	sand	118,486	320	1,300	1,100	310 U	17,000	3,300
SC-3	8-10	13-Jun-05	--	silty clay	4,980,661	13,000	1,500	370	340 U	11,000	700
	10-12	13-Jun-05	--	sand	118,486	310 U	310 U	310 U	310 U	2,700	610 U
	12-14	13-Jun-05	--	sand	118,486	1,300	880	320 U	320 U	320 U	650 U
	14-16	13-Jun-05	--	sand	118,486	330 U	330 U	330 U	330 U	330 U	670 U
	16-18	13-Jun-05	--	sand (high organics)	118,486	1,300	560 U	560 U	560 U	560 U	1100 U
	16-18	13-Jun-05	Field Duplicate	sand (high organics)	118,486	1,100	560 U	560 U	560 U	560 U	1100 U
	18-20	13-Jun-05	--	peat	38,535,200	870 U	870 U	870 U	870 U	870 U	1700 U
	4-6	13-Jun-05	--	sand	118,486	310 U	310 U	310 U	310 U	1,300	620 U
	6-8	13-Jun-05	--	sand	118,486	300 U	300 U	300 U	300 U	8,600	730
	8-10	13-Jun-05	--	silty clay	4,980,661	21,000	5,300	340 U	340 U	3,600	690 U
SC-4	10-12	13-Jun-05	--	sand	118,486	8,800	2,500	330 U	330 U	1,100	660 U
	10-12	15-Jun-05	Field Duplicate	sand	118,486	7,500	2,200	330 U	330 U	1000	660 U
	12-14	13-Jun-05	--	silty sand	118,486	330 U	330 U	330 U	330 U	330 U	660 U
	14-16	13-Jun-05	--	silty sand	118,486	330 U	330 U	330 U	330 U	330 U	670 U
	16-18	13-Jun-05	--	clay	4,980,661	1300 U	1300 U	1300 U	1300 U	1300 U	2700 U
	18-20	13-Jun-05	--	peat	38,535,200	770 U	770 U	770 U	770 U	770 U	1500 U
	4-6	14-Jun-05	--	sand	118,486	300 U	300 U	300 U	300 U	1,800	600 U
	6-8	14-Jun-05	--	sand	118,486	310 U	310 U	310 U	310 U	1,400	610 U
	8-10	14-Jun-05	--	silty clay	4,980,661	310 U	310 U	310 U	310 U	310 U	620 U
	10-12	14-Jun-05	--	sand	118,486	340 U	340 U	340 U	340 U	340 U	690 U
SC-5	12-14	14-Jun-05	--	sand	118,486	330 U	330 U	330 U	330 U	330 U	660 U
	14-16	14-Jun-05	--	sand	118,486	330 U	330 U	330 U	330 U	330 U	660 U
	16-18	14-Jun-05	--	silty sand	118,486	420 U	420 U	420 U	420 U	420 U	830 U
	18-20	14-Jun-05	--	peat	38,535,200	1300 U	1300 U	1300 U	1300 U	1300 U	2700 U
	4-6	14-Jun-05	--	sand	118,486	300 U	300 U	300 U	300 U	300 U	600 U
	6-8	14-Jun-05	--	silty sand	118,486	310 U	310 U	310 U	310 U	1,700	810
	8-10	14-Jun-05	--	clay	4,980,661	9,700	5,500	350 U	350 U	6,200	870
	10-12	14-Jun-05	--	sand	118,486	12,000	5,300	320 U	320 U	3,400	640 U
	12-14	14-Jun-05	--	sand	118,486	2,600	500	330 U	330 U	330 U	670 U
	14-16	14-Jun-05	--	sand	118,486	510	330 U	330 U	330 U	330 U	660 U
SC-6	16-18	14-Jun-05	--	silty clay	4,980,661	840 U	840 U	840 U	840 U	840 U	1700 U
	18-20	14-Jun-05	--	peat	38,535,200	1400 U	1400 U	1400 U	1400 U	1400 U	2800 U
	4-6	15-Jun-05	--	sand	118,486	610,000	90,000	16000 U	16000 U	17,000	32000 U
	6-8	15-Jun-05	--	sand	118,486	1,500,000	85,000	30000 U	30000 U	30000 U	61000 U
	8-10	15-Jun-05	--	clay	4,980,661	1,700,000	45,000	34000 U	34000 U	34000 U	69000 U
	10-12	15-Jun-05	--	silty clay	4,980,661	190,000	7,200	5900 U	5900 U	5900 U	12000 U
	12-14	15-Jun-05	--	sand	118,486	11,000,000	410000 U	410000 U	410000 U	410000 U	820000 U
	14-16	15-Jun-05	--	sand	118,486	120,000	3300 U	3300 U	3300 U	3300 U	6700 U
	16-18	--	--	sand (assumed)	118,486	--	--	--	--	--	--
	18-20	15-Jun-05	--	peat	38,535,200	340,000	6100 U	6100 U	6100 U	6100 U	12000 U
SC-7	4-6	15-Jun-05	--	silty sand	118,486	1200 U	1200 U	1200 U	1200 U	32,000	2400 U
	6-8	15-Jun-05	--	sand	118,486	2,500	17,000	460	350 U	22,000	700 U
	8-10	15-Jun-05	--	clay	4,980,661	6,700	27,000	750	690 U	25,000	1400 U
	10-12	15-Jun-05	Field Duplicate	clay	4,980,661	6,400	28,000	720	720 U	25,000	1400 U
	12-14	15-Jun-05	--	silty clay	4,980,661	24,000	12,000	320 U	320 U	3,900	640 U
	12-14	15-Jun-05	--	sand	118,486	110,000	2,100	1700 U	1700 U	1700 U	3400 U
	14-16	15-Jun-05	--	sand	118,486	47,000	2,100	1300 U	1300 U	1300 U	2700 U
	16-18	15-Jun-05	--	sand	118,486	5,800	820	720 U	720 U	720 U	1400 U
	18-20	15-Jun-05	--	peat	38,535,200	1900 U	1900 U	1900 U	1900 U	1900 U	3700 U
	4-6	21-Jun-06	--	silty sand	118,486	18,000	61,000	6200 U	6200 U	42,000	12000 U
SC-8	6-8	21-Jun-06	--	silty sand and clay	2,293,690	330 U	410	400	330 U	12,000	2,200
	8-10	21-Jun-06	--	clay	4,980,661	360 U	360 U	360 U	360 U	1,200	1,600
	10-12	21-Jun-06	--	sand and clay	2,293,690	320 U	320 U	320 U	320 U	710	640 U
	12-14	21-Jun-06	--	sand	118,486	330 U	330 U	330 U	330 U	330 U	660 U
	14-16	21-Jun-06	--	sand	118,486	330 U	330 U	330 U	330 U	330 U	660 U
	14-16	21-Jun-06	Field Duplicate	sand	118,486	340 U	340 U	340 U	340 U	340 U	670 U
	16-18	21-Jun-06	--	silty sand	118,486	510 U	510 U	510 U	510 U	510 U	1000 U
	18-20	21-Jun-06	--	peat	38,535,200	890 U	890 U	890 U	890 U	890 U	1800 U

TABLE E-3: VOC CONCENTRATIONS FROM SOIL SAMPLES
Parris Island, South Carolina

Geosyntec Consultants

Location	Sample Depth (ft)	Date Sampled	Duplicate	Dominant Lithology	Ct (max) (µg/kg)	Tetrachloroethene (µg/kg)	Trichloroethene (µg/kg)	trans-1,2-Dichloroethene (µg/kg)	1,1-DCE (µg/kg)	cis-1,2-DCE (µg/kg)	Vinyl chloride (µg/kg)
SC-10	4-6	17-Mar-09	--	sand	118,486	2,900 U	2,900 U	2,900 U	2900 U	9,900	5,800 U
	6-8	17-Mar-09	--	sand	118,486	310 U	310 U	310 U	310 U	1,300	1,100
	8-10	17-Mar-09	--	silty clay	4,980,661	350 U	350 U	350 U	350 U	1,000	690 U
	10-12	17-Mar-09	--	sand	118,486	310 U	310 U	310 U	310 U	390	630 U
	12-14	17-Mar-09	--	sand	118,486	320 U	320 U	320 U	320 U	320 U	630 U
	14-16	17-Mar-09	--	sand	118,486	330 U	330 U	330 U	330 U	330 U	660 U
	16-18	17-Mar-09	--	sand (high organics)	118,486	480 U	480 U	480 U	480 U	480 U	960 U
	18-20	17-Mar-09	--	peat	38,535,200	610 U	610 U	610 U	610 U	1,400	1,200 U
SC-11	4-6	17-Mar-09	--	silty sand	118,486	3,000 U	8,500	3,000 U	3000 U	59,000	6,000 U
	6-8	17-Mar-09	--	silty sand and clay	2,293,690	320 U	320 U	320 U	320 U	320 U	630 U
	8-10	17-Mar-09	--	clay	4,980,661	330 U	330 U	330 U	330 U	330 U	670 U
	10-12	17-Mar-09	--	sand and clay	2,293,690	310 U	310 U	310 U	310 U	310 U	630 U
	12-14	17-Mar-09	--	sand	118,486	320 U	320 U	320 U	320 U	420	650 U
	12-14	17-Mar-09	Field Duplicate	sand	118,486	320 U	320 U	320 U	320 U	710	650 U
	14-16	17-Mar-09	--	sand	118,486	320 U	320 U	320 U	320 U	920	650 U
	16-18	17-Mar-09	--	silty sand	118,486	480 U	480 U	480 U	480 U	480 U	970 U
SC-12	18-20	17-Mar-09	--	peat	38,535,200	660 U	660 U	660 U	660 U	660 U	1,300 U
	4-6	17-Mar-09	--	sand	118,486	240,000	150,000	3,000 U	3,000 U	48,000	6,100 U
	6-8	17-Mar-09	--	sand	118,486	140,000	110,000	3,000 U	3,000 U	38,000	6,100 U
	8-10	17-Mar-09	--	clay	4,980,661	140,000	93,000	1,800 U	1,800 U	69,000	3,600 U
	10-12	17-Mar-09	--	silty clay	4,980,661	7,000	5,000	310 U	310 U	9,000	630 U
	12-14	17-Mar-09	--	sand	118,486	1,000,000	69,000	14,000 U	14,000 U	44,000	27,000 U
	14-16	17-Mar-09	--	sand	118,486	1,900	330 U	330 U	330 U	16,000	650 U
	16-18	17-Mar-09	--	sand (assumed)	118,486	15,000	2,700	360 U	360 U	51,000	720 U
SC-13	18-20	17-Mar-09	--	peat	38,535,200	440,000	400,000	5,900 U	5,900 U	250,000	12,000 U
	4-6	17-Mar-09	--	silty sand	118,486	1,500 U	1,500 U	1,500 U	1,500 U	32,000	3,000 U
	6-8	17-Mar-09	--	sand	118,486	1,100 U	1,100 U	1,100 U	1,100 U	23,000	2,200 U
	8-10	17-Mar-09	--	clay	4,980,661	350 U	350 U	350 U	350 U	18,000	710 U
	10-12	17-Mar-09	--	silty clay	4,980,661	320 U	320 U	320 U	320 U	15,000	630 U
	12-14	17-Mar-09	--	sand	118,486	580	320 U	320 U	320 U	18,000	650 U
	12-14	17-Mar-09	Field Duplicate	sand	118,486	1,900	320 U	320 U	320 U	23,000	640 U
	14-16	17-Mar-09	--	sand	118,486	320 U	320 U	320 U	320 U	5,900	650 U
	16-18	17-Mar-09	--	sand	118,486	440 U	440 U	440 U	440 U	2,400	880 U
	18-20	17-Mar-09	--	peat	38,535,200	340,000	13,000	1,300 U	1,300 U	33,000	2,700 U

Notes:

ft - feet

-- - not collected/measured

µg/kg - micrograms per kilogram

"U" - not detected (reported at detection limit)

C_t - maximum PCE concentration in the dissolved and adsorbed phases (mg/Kg)

C_{water} - PCE Solubility; 240 mg/L at 20°C (maximum value found in literature)

ρ_b - bulk density of soil (g/cm³): silty clay=0.98; sand=1.55; peat=0.3 (from SC-9)

n - porosity (unitless): silty clay=0.625; sand=0.281; peat=0.844 (from SC-9)

K_d - partitioning coefficient of PCE in soil [(mg/Kg)/(mg/L)] = K_{oc}f_{oc}

K_{oc} - organic carbon partition coefficient for PCE [(mg/Kg)/(mg/L)]: silty clay= 447^a; sand = 355^a; peat = 631^a

f_{oc} - fraction organic carbon (unitless): silty clay=0.045; sand=0.00088; peat=0.25 (from SC-9)

Yellow background - PCE concentration > than maximum dissolved and sorbed concentration; presence of DNAPL

^a - Groundwater Chemicals Desk Reference, 3rd Edition

$$C_t = \frac{C_{\text{water}} (K_d \rho_b + n)}{\rho_b}$$

**TABLE E-4: ESTIMATED MASS OF TARGET VOCs IN PNEUMATIC INJECTION
AND DIRECT INJECTION TEST PLOTS
Parris Island, South Carolina**

Geosyntec Consultants

Media	VOC	Pneumatic Injection Test Plot Mass (g)			Direct Injection Test Plot Mass (g)		
		Sorbed/Dissolved	DNAPL	Total	Sorbed/Dissolved	DNAPL	Total
Soil ¹	Tetrachloroethene	2,760	29,028	31,788	119	13	132
	Trichloroethene	1,317	0	1,317	4	0	4
	cis-1,2-Dichloroethene	1,254	0	1,254	2	0	2
	Vinyl Chloride	2,214	0	2,214	5	0	5
Groundwater ²	Tetrachloroethene	577	0	577	6	0	6
	Trichloroethene	267	0	267	4	0	4
	cis-1,2-Dichloroethene	588	0	588	3	0	3
	Vinyl Chloride	12	0	12	0	0	0
Total Mass (g)		8,990	29,028	38,018	144	13	156

Notes:

g - grams

¹ - Soil data based on SC-1 Pre-Injection data

² - Groundwater data is based on TW-1 data

**TABLE E-5: CALCULATION OF PRE-INJECTION ESTIMATED MASS OF DISSOLVED-PHASE TARGET VOCs IN PNEUMATIC INJECTION TEST PLOT
Parris Island, South Carolina**

Geosyntec Consultants

Treatment Zone Groundwater Concentrations					
Location	Date Sampled	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)
PMW-5	13-Oct-06	57,000	26,000	50,000	500
PMW-6	13-Oct-06	180	490	8,300	710
Average		28,590	13,245	29,150	605

Treatment Zone Porosity Calculation ¹						
Depth	SC-3	SC-7	SC-8	SC-9	Most Prevalent Soil Type	Porosity (from SC-9)
6-8	sand	sand	sand	silty sand and clay	sand	0.281
8-10	silty clay	clay	clay	clay	clay	0.625
10-12	sand	silty clay	silty clay	sand and clay	clay	0.625
12-14	sand	sand	sand	sand	sand	0.281
14-16	sand	sand	sand	sand	sand	0.281
16-18	sand (high organics)	--	sand	silty sand	sand	0.281
Average						0.396

Treatment Zone Pore Volume ²	
Porosity	Pore Volume (L)
0.396	20167

Dissolved-Phase VOC Mass ³			
Tetrachloroethene (g)	Trichloroethene (g)	cis-1,2-Dichloroethene (g)	Vinyl chloride (g)
577	267	588	12

Notes:

ft - Feet

µg/L - micrograms per liter

L - liters

g - grams

bold - compound detected at reported concentration

¹ - Porosity for Pneumatic Injection test plot calculated using most prevalent soil type in SC-3, 7, 8 and 9

² - Pneumatic Injection test plot treatment zone pore volume calculated as:

pore vol = V x n

where:

V= total volume (l x w x h)

l= treatment zone length (10 ft)

w= treatment zone width (15 ft)

h= treatment zone height (12 ft; 6-18 ft bgs)

n= avg porosity over treatment zone

³ - Total VOC mass calculated as dissolved phase concentration multiplied by pore volume of treatment zone

TABLE E-6: CALCULATION OF PRE-INJECTION ESTIMATED MASS OF SORBED/DNAPL TARGET VOCs IN PNEUMATIC INJECTION TEST PLOT
Parris Island, South Carolina

Geosyntec Consultants

Location	Sample Depth (ft)	Date Sampled	Dominant Lithology	Ct max (PCE) (µg/Kg)	Soil Mass (kg)	Tetrachloroethene			Trichloroethene		cis-1,2-Dichloroethene		Vinyl chloride	
						Soil Concentration (µg/Kg)	Total Mass in Soil (g)	DNAPL Mass (g)	Soil Concentration (µg/Kg)	Total Mass in Soil (g)	Soil Concentration (µg/Kg)	Total Mass in Soil (g)	Soil Concentration (µg/Kg)	Total Mass in Soil (g)
SC-3	6-8	13-Jun-05	sand	118,486	2,366.8	320	0.76	0.00	1,300	3.08	17,000	40.24	3,300	7.81
	8-10	13-Jun-05	silty clay	4,980,661	780.5	13,000	10.15	0.00	1,500	1.17	11,000	8.59	700	0.55
	10-12	13-Jun-05	sand	118,486	2,366.8	310	0.73	0.00	310	0.73	2,700	6.39	610	1.44
	12-14	13-Jun-05	sand	118,486	2,366.8	1,300	3.08	0.00	880	2.08	320	0.76	650	1.54
	14-16	13-Jun-05	sand	118,486	2,366.8	330	0.78	0.00	330	0.78	330	0.78	670	1.59
SC-7	16-18	13-Jun-05	sand (high organics)	118,486	2,366.8	1,300	3.08	0.00	560	1.33	560	1.33	1,100	2.60
	6-8	15-Jun-05	sand	118,486	2,366.8	1,500,000	3,550.24	3,269.81	85,000	201.18	30,000	71.00	61,000	144.38
	8-10	15-Jun-05	clay	4,980,661	780.5	1,700,000	1,326.82	0.00	45,000	35.12	34,000	26.54	69,000	53.85
	10-12	15-Jun-05	silty clay	4,980,661	780.5	190,000	148.29	0.00	7,200	5.62	5,900	4.60	12,000	9.37
	12-14	15-Jun-05	sand	118,486	2,366.8	11,000,000	26,035.11	25,754.68	410,000	970.40	410,000	970.40	820,000	1,940.80
SC-8	14-16	15-Jun-05	sand	118,486	2,366.8	120,000	284.02	3.58	3,300	7.81	3,300	7.81	6,700	15.86
	16-18	--	sand (assumed)	118,486	2,366.8	--	6.00	0.00	--	1.49	--	1.41	--	2.76
	6-8	15-Jun-05	sand	118,486	2,366.8	2,500	5.92	0.00	17,000	40.24	22,000	52.07	700	1.66
	8-10	15-Jun-05	clay	4,980,661	780.5	6,700	5.23	0.00	27,000	21.07	25,000	19.51	1,400	1.09
	10-12	15-Jun-05	silty clay	4,980,661	780.5	24,000	18.73	0.00	12,000	9.37	3,900	3.04	640	0.50
SC-9	12-14	15-Jun-05	sand	118,486	2,366.8	110,000	260.35	0.00	2,100	4.97	1,700	4.02	3,400	8.05
	14-16	15-Jun-05	sand	118,486	2,366.8	47,000	111.24	0.00	2,100	4.97	1,300	3.08	2,700	6.39
	16-18	15-Jun-05	sand	118,486	2,366.8	5,800	13.73	0.00	820	1.94	720	1.70	1,400	3.31
	6-8	21-Jun-06	silty sand and clay	2,293,690	1,469.5	330	0.48	0.00	410	0.60	12,000	17.63	2,200	3.23
	8-10	21-Jun-06	clay	4,980,661	780.5	360	0.28	0.00	360	0.28	12,000	9.37	1,600	1.25
SC-9	10-12	21-Jun-06	sand and clay	2,293,690	1,469.5	320	0.47	0.00	320	0.47	710	1.04	640	0.94
	12-14	21-Jun-06	sand	118,486	2,366.8	330	0.78	0.00	330	0.78	330	0.78	660	1.56
	14-16	21-Jun-06	sand	118,486	2,366.8	330	0.78	0.00	330	0.78	330	0.78	660	1.56
	16-18	21-Jun-06	silty sand	118,486	2,366.8	510	1.21	0.00	510	1.21	510	1.21	1,000	2.37
						Total (g)	31,788.26	29,028.07		1,317.47		1,254.09		2,214.46

Notes:

C_{water} - PCE Solubility; 240 mg/L at 20°C (maximum value found in literature)

C_{water} - PCE Solubility; 240 mg/L at 20°C (maximum value found in literature)

ρ_b - bulk density of soil (g/cm³): silty clay=0.98; sand=1.55; peat=0.3 (from SC-9)

n - porosity (unitless): silty clay=0.625; sand=0.281; peat=0.844 (from SC-9)

K_d - partitioning coefficient of PCE in soil [(mg/Kg)/(mg/L)] = K_{oc}f_{oc}

K_{oc} - organic carbon partition coefficient for PCE [(mg/Kg)/(mg/L)]: silty clay= 447¹; sand = 355¹; peat = 631¹

f_{oc} - fraction organic carbon (unitless): silty clay=0.045; sand=0.00088; peat=0.25 (from SC-9)

¹ - Groundwater Chemicals Desk Reference, 3rd Edition

-- - not sampled

Yellow PCE concentration > than maximum dissolved and sorbed concentration; presence of DNAPL

Blue Value calculated using average of values for same depth interval in other cores

µg/kg - micrograms per kilogram

g - grams

¹ - Mass of soil in Pneumatic Injection test plot calculated as:

mass = l x w x h x p x (1-n)

where:

l= 1/2 of total length since plot divided into 4 quadrants

w= 1/2 of total width since plot divided into 4 quadrants

h= interval height

p= bulk density

n= porosity (average porosity for intervals where more than one soil type exists)

**TABLE E-7: PRE-INJECTION ESTIMATED MASS OF TARGET VOCs
IN PNEUMATIC INJECTION TEST PLOT
Parris Island, South Carolina**

Media	VOC	Pre-Injection Mass (g)		
		Sorbed/Dissolved	DNAPL	Total
Soil ¹	Tetrachloroethene	2,760	29,028	31,788
	Trichloroethene	1,317	0	1,317
	cis-1,2-Dichloroethene	1,254	0	1,254
	Vinyl Chloride	2,214	0	2,214
Groundwater ²	Tetrachloroethene	577	0	577
	Trichloroethene	267	0	267
	cis-1,2-Dichloroethene	588	0	588
	Vinyl Chloride	12	0	12
Total Mass (g)		8,990	29,028	38,018

Notes:

g - grams

¹ - Soil data based on SC-1 through SC-9² - Groundwater data is based on PM-5 and PM-6 , the two fully screened wells within the plot

**TABLE E-8: CALCULATION OF POST-DEMONSTRATION ESTIMATED MASS OF DISSOLVED-PHASE TARGET VOCs IN PNEUMATIC INJECTION TEST PLOT
Parris Island, South Carolina**

Geosyntec Consultants

Treatment Zone Groundwater Concentrations					
Location	Date Sampled	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)
PMW-5	05-Mar-09	33,000	18,000	81,000	4,200
PMW-6	04-Mar-09	2	18	180	230
Average		16,501	9,009	40,590	2,215

Treatment Zone Porosity Calculation ¹						
Depth	SC-3	SC-7	SC-8	SC-9	Most Prevalent Soil Type	Porosity (from SC-9)
6-8	sand	sand	sand	silty sand and clay	sand	0.281
8-10	silty clay	clay	clay	clay	clay	0.625
10-12	sand	silty clay	silty clay	sand and clay	clay	0.625
12-14	sand	sand	sand	sand	sand	0.281
14-16	sand	sand	sand	sand	sand	0.281
16-18	sand (high organics)	--	sand	silty sand	sand	0.281
Average						0.396

Treatment Zone Pore Volume ²	
Porosity	Pore Volume (L)
0.396	20167

Dissolved-Phase VOC Mass ³			
Tetrachloroethene (g)	Trichloroethene (g)	cis-1,2-Dichloroethene (g)	Vinyl chloride (g)
333	182	819	45

Notes:

ft - Feet

µg/L - micrograms per liter

L - liters

g - grams

bold - compound detected at reported concentration

¹ - Porosity for Pneumatic Injection test plot calculated using most prevalent soil type in SC-3, 7, 8 and 9

² - Pneumatic Injection test plot treatment zone pore volume calculated as:

pore vol = V x n

where:

V= total volume (l x w x h)

l= treatment zone length (10 ft)

w= treatment zone width (15 ft)

h= treatment zone height (12 ft; 6-18 ft bgs)

n= avg porosity over treatment zone

³ - Total VOC mass calculated as dissolved phase concentration multiplied by pore volume of treatment zone

TABLE E-9: CALCULATION OF POST-DEMONSTRATION ESTIMATED MASS OF SORBED/DNAPL TARGET VOCs IN PNEUMATIC INJECTION TEST PLOT
Parris Island, South Carolina

Geosyntec Consultants

Location	Sample Depth (ft)	Date Sampled	Dominant Lithology	Ct max (PCE) (µg/Kg)	Soil Mass (kg)	Tetrachloroethene			Trichloroethene		cis-1,2-Dichloroethene		Vinyl chloride	
						Soil Concentration (µg/Kg)	Total Mass in Soil (g)	DNAPL Mass (g)	Soil Concentration (µg/Kg)	Total Mass in Soil (g)	Soil Concentration (µg/Kg)	Total Mass in Soil (g)	Soil Concentration (µg/Kg)	Total Mass in Soil (g)
SC-10	6-8	17-Mar-09	sand	118,486	2,366.8	310	0.73	0.00	310	0.73	1,300	3.08	1,100	2.60
	8-10	17-Mar-09	silty clay	4,980,661	780.5	350	0.27	0.00	350	0.27	1,000	0.78	690	0.54
	10-12	17-Mar-09	sand	118,486	2,366.8	310	0.73	0.00	310	0.73	390	0.92	630	1.49
	12-14	17-Mar-09	sand	118,486	2,366.8	320	0.76	0.00	320	0.76	320	0.76	630	1.49
	14-16	17-Mar-09	sand	118,486	2,366.8	330	0.78	0.00	330	0.78	330	0.78	660	1.56
SC-11	16-18	17-Mar-09	sand (high organics)	118,486	2,366.8	480	1.14	0.00	480	1.14	480	1.14	960	2.27
	6-8	17-Mar-09	silty sand and clay	2,293,690	1469.55	320	0.47	0.00	320	0.47	320	0.47	630	0.93
	8-10	17-Mar-09	clay	4,980,661	780.5	330	0.26	0.00	330	0.26	330	0.26	670	0.52
	10-12	17-Mar-09	sand and clay	2,293,690	1469.55	310	0.46	0.00	310	0.46	310	0.46	630	0.93
	12-14	17-Mar-09	sand	118,486	2,366.8	320	0.76	0.00	320	0.76	420	0.99	650	1.54
SC-12	14-16	17-Mar-09	sand	118,486	2,366.8	320	0.76	0.00	320	0.76	920	2.18	650	1.54
	16-18	17-Mar-09	silty sand	118,486	2,366.8	480	1.14	0.00	480	1.14	480	1.14	970	2.30
	6-8	17-Mar-09	sand	118,486	2,366.8	140,000	331.36	50.92	110,000	260.35	38,000	89.94	6,100	14.44
	8-10	17-Mar-09	clay	4,980,661	780.5	140,000	109.27	0.00	93,000	72.58	69,000	53.85	3,600	2.81
	10-12	17-Mar-09	silty clay	4,980,661	780.5	7,000	5.46	0.00	5,000	3.90	9,000	7.02	630	0.49
SC-13	12-14	17-Mar-09	sand	118,486	2,366.8	1,000,000	2,366.83	2,086.39	69,000	163.31	44,000	104.14	27,000	63.90
	14-16	17-Mar-09	sand	118,486	2,366.8	1,900	4.50	0.00	330	0.78	16,000	37.87	650	1.54
	16-18	17-Mar-09	sand (assumed)	118,486	2,366.8	15,000	35.50	0.00	2,700	6.39	51,000	120.71	720	1.70
	6-8	17-Mar-09	sand	118,486	2,366.8	1,100	2.60	0.00	1,100	2.60	23,000	54.44	2,200	5.21
	8-10	17-Mar-09	clay	4,980,661	780.5	350	0.27	0.00	350	0.27	18,000	14.05	710	0.55
SC-13	10-12	17-Mar-09	silty clay	4,980,661	780.5	320	0.25	0.00	320	0.25	15,000	11.71	630	0.49
	12-14	17-Mar-09	sand	118,486	2,366.8	580	1.37	0.00	320	0.76	18,000	42.60	650	1.54
	14-16	17-Mar-09	sand	118,486	2,366.8	320	0.76	0.00	320	0.76	5,900	13.96	650	1.54
	16-18	17-Mar-09	sand	118,486	2,366.8	440	1.04	0.00	440	1.04	2,400	5.68	880	2.08
						Total (g)	2,867.46	2,137.31		521.25		568.92		114.00

Notes:

C_{water} - PCE Solubility; 240 mg/L at 20°C (maximum value found in literature)

C_{soil} - PCE Solubility; 240 mg/L at 20°C (maximum value found in literature)

ρ_b - bulk density of soil (g/cm³); silty clay=0.98; sand=1.55; peat=0.3 (from SC-9)

n - porosity (unitless); silty clay=0.625; sand=0.281; peat=0.844 (from SC-9)

K_d - partitioning coefficient of PCE in soil [(mg/Kg)/(mg/L)] = K_{oc}f_{oc}

K_{oc} - organic carbon partition coefficient for PCE [(mg/Kg)/(mg/L)]; silty clay= 447¹; sand = 355¹; peat = 631¹

f_{oc} - fraction organic carbon (unitless); silty clay=0.045; sand=0.00088; peat=0.25 (from SC-9)

¹ - Groundwater Chemicals Desk Reference, 3rd Edition

-- - not sampled

 PCE concentration > than maximum dissolved and sorbed concentration; presence of DNAPL

 Value calculated using average of values for same depth interval in other cores

µg/kg - micrograms per kilogram

g - grams

¹ - Mass of soil in Pneumatic Injection test plot calculated as:

mass = l x w x h x p x (1-n)

where:

l= 1/2 of total length since plot divided into 4 quadrants

w= 1/2 of total width since plot divided into 4 quadrants

h= interval height

p= bulk density

n= porosity (average porosity for intervals where more than one soil type exists)

**TABLE E-10: POST-DEMONSTRATION ESTIMATED MASS OF TARGET VOCs
IN PNEUMATIC INJECTION TEST PLOT
Parris Island, South Carolina**

Geosyntec Consultants

Media	VOC	Post-Demonstration Mass (g)		
		Sorbed/Dissolved	DNAPL	Total
Soil ¹	Tetrachloroethene	730	2,137	2,867
	Trichloroethene	521	0	521
	cis-1,2-Dichloroethene	569	0	569
	Vinyl Chloride	114	0	114
Groundwater ²	Tetrachloroethene	333	0	333
	Trichloroethene	182	0	182
	cis-1,2-Dichloroethene	819	0	819
	Vinyl Chloride	45	0	45
Total Mass (g)		3,312	2,137	5,449

Notes:

g - grams

¹ - Soil data based on SC-10 through SC-13

² - Groundwater data is based on PM-5 and PM-6 , the two fully screened wells within the plot

TABLE E-11: JUNE 2006 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (mg/L)	ORP (mV)	Turbidity (NTU)
PMW-1	26-Jun-06	3.50	9:07 AM	0.280	--	--	--	--	--	--
			9:10 AM		--	6.2	494	0.8	14.1	670.00
			9:15 AM		25.3	6.2	485	0.6	3.5	679.00
			9:25 AM		25.5	6.1	481	0.5	-5.7	77.50
			9:43 AM		25.3	6.1	468	0.3	-2.8	29.30
			9:50 AM		25.7	6.1	479	0.3	-4.4	31.90
			9:55 AM		25.8	6.1	474	0.2	-6.9	103.00
			9:59 AM		25.4	6.1	480	0.2	-26.6	174.00
			10:05 AM		25.3	6.1	489	0.1	-34.5	323.00
			10:10 AM		25.2	6.1	497	0.1	-41.0	539.00
			10:15 AM		25.6	6.2	505	0.2	-26.2	693.00
PMW-2	26-Jun-06	3.63	11:25 AM	0.340	--	--	--	--	--	--
			11:27 AM		23.5	6.0	454	0.6	37.4	41.40
			11:32 AM		23.7	5.9	468	0.1	5.4	18.30
			11:46 AM		23.7	5.9	467	0.0	-31.0	12.60
			11:54 AM		23.7	5.9	472	0.0	-39.5	13.50
			12:10 PM		23.7	5.9	459	0.0	-44.7	10.40
			12:21 PM		23.7	5.9	469	0.1	-57.6	7.92
			12:25 PM		23.4	6.0	480	0.0	-61.4	7.67
			12:30 PM		23.5	6.0	469	0.0	-61.5	8.77
			12:35 PM		23.5	5.9	468	0.0	-62.7	6.45
			12:40 PM		23.7	5.9	478	0.0	-66.2	5.47
PMW-3	26-Jun-06	3.71	3:56 PM	0.490	--	--	--	--	--	--
			3:58 PM		25.0	5.9	373	0.6	1.8	18.70
			4:02 PM		23.6	5.8	379	0.0	9.4	24.50
			4:06 PM		23.4	5.8	402	0.0	1.6	13.20
			4:11 PM		23.2	5.8	425	0.0	-19.4	7.42
			4:15 PM		23.5	5.8	453	0.0	-31.9	6.98
			4:20 PM		23.4	5.8	478	0.0	-41.1	6.09
			4:25 PM		23.5	5.8	477	0.0	-4.4	5.48
			4:30 PM		23.4	5.8	497	0.0	-50.1	4.68
PMW-4	26-Jun-06	3.61	5:26 PM	0.480	--	--	--	--	--	--
			5:30 PM		23.7	5.7	438	0.2	65.2	68.10
			5:35 PM		23.9	5.6	435	0.2	68.1	61.30
			5:40 PM		23.7	5.6	432	0.1	67.6	58.20
			5:45 PM		23.9	5.6	431	0.0	56.7	41.70
			5:53 PM		23.4	5.6	435	0.0	40.5	19.10
			6:15 PM		23.5	5.6	434	0.0	25.7	4.94
			6:20 PM		23.5	5.6	437	0.0	23.3	4.47
PMW-5	27-Jun-06	3.48	8:02 AM	0.480	--	--	--	--	--	--
			8:06 AM		22.8	5.7	464	2.9	82.2	55.70
			8:24 AM		23.0	5.7	472	1.9	27.1	55.70
			8:33 AM		22.8	5.7	478	1.9	-35.9	23.10
			8:39 AM		22.7	5.6	481	1.9	-55.4	15.40
			8:45 AM		22.7	5.6	490	1.8	-65.0	9.82
PMW-6	26-Jun-06	3.70	2:06 PM	0.500	--	--	--	--	--	--
			2:09 PM		23.5	5.9	416	0.0	15.4	26.30
			2:14 PM		23.0	5.9	418	0.0	-0.8	22.90
			2:17 PM		23.1	5.9	418	0.0	-10.2	15.70
			2:20 PM		23.0	5.9	423	0.0	-20.9	14.10
			2:25 PM		23.5	5.9	420	0.0	-24.2	10.20
			2:30 PM		23.4	5.9	429	0.0	-34.2	5.11
			2:35 PM		23.4	5.9	438	0.0	-44.9	4.02
			2:40 PM		23.5	5.9	443	0.0	-54.2	2.44
			2:45 PM		23.4	5.9	449	0.0	-59.1	2.49
ML1-2	29-Jun-06	--	4:22 PM	0.023	--	--	--	--	--	--
			4:42 PM		36.8	6.2	505	1.7	-52.2	555.00
			4:52 PM		36.0	6.2	536	1.6	-55.9	241.00
			5:08 PM		35.3	6.2	607	1.5	-55.9	74.60
			5:15 PM		35.2	6.2	634	1.5	-59.3	50.20
ML1-3	27-Jun-06	--	--	--	--	--	--	--	--	--
ML1-5	27-Jun-06	--	10:33 AM	--	27.3	6.0	518	0.5	1.1	>1000
			11:42 AM		--	--	--	--	--	--
ML1-7	27-Jun-06	--	11:52 AM	0.160	24.1	6.3	1831	0.0	-25.2	312.00
			12:22 PM		--	--	--	--	--	--
ML2-2	29-Jun-06	--	12:43 PM	--	24.7	6.0	1696	0.0	59.0	6.88
			6:00 PM		--	--	--	--	--	--
			6:20 PM		34.7	6.4	660	1.7	-9.4	485.00
			6:30 PM		33.9	6.4	655	1.7	-16.2	192.00
ML2-3	27-Jun-06	--	6:41 PM	0.180	33.3	6.4	672	1.7	-20.2	90.60
			2:17 PM		--	--	--	--	--	--
			2:25 PM		26.1	6.4	984	0.7	24.8	>1000
ML2-5	27-Jun-06	--	2:30 PM	0.180	26.7	6.4	1311	0.5	14.8	>66
			2:55 PM		--	--	--	--	--	--
			3:05 PM		24.4	6.4	1600	0.7	-41.5	>31
			3:15 PM		23.9	6.4	1509	0.9	-47.6	230.00

TABLE E-11: JUNE 2006 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (mg/L)	ORP (mV)	Turbidity (NTU)
ML2-7	27-Jun-06	--	3:43 PM	0.180	--	--	--	--	--	--
			3:53 PM		24.7	6.3	1452	0.9	60.4	209.00
			4:00 PM		24.2	6.6	4930	0.6	25.6	17.30
			4:05 PM		23.9	6.7	4630	0.4	4.2	12.90
			4:10 PM		24.0	6.7	3870	0.3	-3.7	13.40
ML3-2	29-Jun-06	--	2:43 PM	0.023	--	--	--	--	--	--
			3:12 PM		32.3	6.2	679	1.6	-43.5	121.00
			3:22 PM		31.5	6.2	690	1.5	-45.4	50.50
			3:30 PM		32.0	6.1	694	1.5	-47.4	18.40
ML3-3	27-Jun-06	--	4:54 PM	0.180	--	--	--	--	--	--
			5:08 PM		24.5	6.4	1732	0.1	-21.9	183.00
			5:16 PM		24.3	6.4	1680	0.2	-26.0	57.90
			5:20 PM		24.4	6.4	1628	0.3	-36.6	29.90
ML3-5	27-Jun-06	--	5:48 PM	0.200	--	--	--	--	--	--
			6:00 PM		23.7	6.8	1808	0.5	-56.5	>1000
			6:05 PM		23.5	6.7	1471	0.6	-39.5	517.00
			6:08 PM		23.4	6.7	1351	0.7	-39.6	338.00
ML3-7	27-Jun-06	--	6:27 PM	0.185	--	--	--	--	--	--
			6:38 PM		23.4	6.5	1372	0.5	23.4	411.00
			6:41 PM		23.5	6.4	1369	0.3	23.5	202.00
			6:45 PM		23.4	6.4	1370	0.3	23.4	70.50
			6:50 PM		23.3	6.4	1356	0.3	23.3	--
ML4-3	28-Jun-06	--	8:21 AM	0.170	--	--	--	--	--	--
			8:34 AM		23.8	6.2	1180	1.9	-16.1	37.90
			8:40 AM		23.9	6.1	1139	2.0	-23.1	12.80
			8:43 AM		24.0	6.1	1135	2.0	-24.0	11.30
ML4-5	28-Jun-06	--	9:00 AM	0.170	--	--	--	--	--	--
			9:12 AM		23.4	6.5	1847	1.4	-39.7	297.00
			9:18 AM		23.3	6.5	1657	1.4	-45.2	171.00
			9:22 AM		23.2	6.5	1517	1.4	-18.6	120.00
ML4-7	28-Jun-06	--	9:41 AM	0.160	--	--	--	--	--	--
			9:48 AM		24.0	6.8	2790	2.0	-1.6	42.50
			9:53 AM		23.3	6.8	2640	0.8	-34.3	7.88
			10:00 AM		22.9	6.7	2430	0.6	-37.4	3.01
			10:03 AM		22.7	6.7	2330	0.6	-36.0	2.55
ML5-2	29-Jun-06	--	12:25 PM	--	--	--	--	--	--	--
			12:45 PM		32.3	6.3	563	1.4	70.9	389.00
			12:55 PM		31.4	6.3	563	1.1	56.4	172.00
			1:10 PM		31.2	6.3	567	1.1	47.0	22.70
ML5-3	28-Jun-06	--	10:30 AM	0.160	--	--	--	--	--	--
			10:39 AM		24.3	6.1	1147	1.6	-20.6	114.00
			10:50 AM		24.1	6.0	1177	1.4	-38.0	10.40
			10:55 AM		24.1	6.0	1184	1.3	-47.0	6.88
ML5-5	28-Jun-06	--	11:35 AM	0.160	--	--	--	--	--	--
			12:05 PM		23.5	6.5	2000	1.4	-29.6	581.00
			12:09 PM		23.2	6.5	1676	1.0	-20.0	267.00
			12:15 PM		23.1	6.4	1465	0.8	-18.2	77.60
			12:20 PM		23.0	6.3	1417	0.8	-12.7	60.80
ML5-7	28-Jun-06	--	12:55 PM	0.160	--	--	--	--	--	--
			1:03 PM		24.0	6.2	2170	1.7	6.6	204.00
			1:10 PM		23.5	6.2	1896	0.6	3.8	75.40
			1:15 PM		23.4	6.2	1698	0.4	3.4	41.70
			1:18 PM		23.4	6.2	1721	0.4	3.6	35.90
ML6-3	28-Jun-06	--	3:35 PM	0.220	--	--	--	--	--	--
			3:46 PM		24.9	6.2	1214	2.7	-60.7	349.00
			3:50 PM		24.8	6.2	1242	2.5	-70.4	26.40
			3:55 PM		24.6	6.2	1352	2.4	-74.7	>1000
			4:00 PM		24.4	6.2	1421	2.3	-80.6	553.00
			4:05 PM		24.4	6.2	1404	2.2	-86.6	46.30
ML6-5	28-Jun-06	--	4:34 PM	0.200	--	--	--	--	--	--
			5:00 PM		24.2	6.3	1220	1.9	-87.1	148.00
			5:05 PM		23.9	6.3	1205	1.9	-89.6	91.00
			5:10 PM		23.9	6.3	1184	1.9	-92.5	52.30
			5:15 PM		23.9	6.2	1167	1.8	-94.3	26.80
			5:18 PM		23.8	6.2	1155	1.7	-95.3	18.50
ML6-7	28-Jun-06	--	5:42 PM	--	--	--	--	--	--	--
			5:46 PM		23.9	6.3	2220	1.2	21.3	141.00
			5:54 PM		22.8	6.3	1641	0.5	22.7	21.30
			5:59 PM		22.7	6.2	1492	0.3	20.6	8.76
			6:02 PM		22.6	6.2	1730	0.4	18.3	11.70
ML7-3	29-Jun-06	--	7:47 AM	0.180	--	--	--	--	--	--
			8:01 AM		23.8	6.2	1637	1.5	-54.4	87.70
			8:10 AM		23.8	6.2	1647	1.8	-70.4	39.20
			8:15 AM		23.8	6.2	1754	1.8	-77.4	25.30
ML7-5	29-Jun-06	--	9:04 AM	--	--	--	--	--	--	--
			9:18 AM		23.1	6.4	2170	1.1	5.9	370.00
			9:22 AM		23.2	6.4	1901	0.8	7.7	206.00
			9:26 AM		22.9	6.3	1605	0.8	9.4	71.00
			9:30 AM		22.9	6.3	1451	0.9	1.2	27.20

TABLE E-11: JUNE 2006 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (mg/L)	ORP (mV)	Turbidity (NTU)
ML7-7	29-Jun-06	--	9:47 AM	0.160	--	--	--	--	--	--
			9:58 AM		23.3	6.2	1297	0.1	39.4	7.77
			10:05 AM		23.3	6.2	1079	0.1	22.1	4.35
			10:09 AM		23.2	6.2	2190	0.1	17.0	3.61
			10:15 AM		23.0	6.3	2250	0.1	1.6	4.67
ML-7-2	29-Jun-06	--	10:40 AM	0.029	--	--	--	--	--	--
			11:06 AM		29.5	6.4	825	1.6	-3.7	>1000
			11:28 AM		32.4	6.4	850	1.7	-17.4	14.30
			11:40 AM		32.1	6.4	895	1.5	-31.6	38.00
			11:45 AM		32.3	6.4	902	1.5	-35.0	19.70

Notes:

ft btoc - feet below top of casing
Lpm - liters per minute
°C - degrees Celsius
µS/cm - microsiemens per centimeter
mg/L - milligrams per litre
mV - millivolts
NTU - nephelometric turbidity units
-- - not recorded/measured

TABLE E-12: AUGUST 2006 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well ID	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (meter)	ORP (mV)	Turbidity (NTU)
PMW-3	21-Aug-06	4.58	8:37 AM	0.360	--	--	--	--	--	--
			9:01 AM		26.1	5.8	566	2.3	-19.6	33.50
			9:30 AM		26.1	5.9	608	1.9	-4.6	6.08
			9:40 AM		26.2	5.9	625	1.6	-12.2	4.46
			9:50 AM		26.1	5.9	639	1.5	-13.9	2.88
PMW-5	21-Aug-06	4.47	8:57 AM	0.340	--	--	--	--	--	--
			10:30 AM		26.6	6.0	745	0.9	-12.7	7.61
			10:52 AM		26.4	6.0	653	0.7	-16.7	2.56
			11:02 AM		26.5	6.0	575	0.9	-20.1	1.47
			11:12 AM		26.3	6.0	605	0.7	-23.9	1.34
PMW-6	21-Aug-06	4.50	11:33 AM	0.350	--	--	--	--	--	--
			11:47 AM		26.6	5.9	481	0.9	-36.6	11.20
			12:04 PM		26.5	5.9	483	0.8	-46.7	6.41
			12:18 PM		26.6	6.0	489	0.7	-70.2	5.58
			12:25 PM		26.4	6.0	495	0.7	-78.6	2.21
ML1-4	21-Aug-06	4.50	1:19 PM	0.160	--	--	--	--	--	--
			1:27 PM		28.2	6.4	1551	2.7	-179.3	7.96
			1:40 PM		29.4	6.4	1558	2.0	-172.2	6.10
ML1-6	21-Aug-06	4.50	2:56 PM	0.120	--	--	--	--	--	--
			3:05 PM		27.9	6.2	904	0.6	-160.1	8.68
			3:15 PM		26.7	6.2	959	0.6	-166.7	2.12
ML2-2	21-Aug-06	4.50	3:19 PM	0.030	--	--	--	--	--	--
ML2-3	22-Aug-06	4.50	3:42 PM	0.135	34.5	5.8	2560	2.0	-69.0	134.00
			4:48 PM		--	--	--	--	--	--
ML2-3	22-Aug-06	4.50	5:00 PM	0.135	29.0	6.1	3	2.1	-82.0	176.00
			5:00 PM		--	--	--	--	--	--
ML2-4	21-Aug-06	4.50	3:56 PM	0.120	--	--	--	--	--	--
			4:03 PM		27.1	6.4	2610	0.6	-2.8	111.00
			4:10 PM		26.7	6.4	1680	0.6	9.4	17.90
ML2-5	22-Aug-06	4.50	5:33 PM	0.135	--	--	--	--	--	--
			5:40 PM		26.2	6.3	1654	1.0	-51.5	96.60
			5:46 PM		25.9	6.3	1382	0.6	-49.1	33.40
ML2-6	21-Aug-06	4.50	4:31 PM	0.150	--	--	--	--	--	--
			4:38 PM		26.9	6.0	1258	0.8	-32.0	57.30
			4:44 PM		25.8	6.0	1145	0.6	-31.9	11.50
ML3-2	22-Aug-06	4.50	1:08 PM	0.030	--	--	--	--	--	--
			1:30 PM		39.5	6.2	1767	1.8	-123.1	1.88
ML3-3	22-Aug-06	4.50	2:04 PM	0.120	--	--	--	--	--	--
			2:13 PM		28.6	6.4	1506	1.0	-133.3	3.40
			2:18 PM		28.6	6.4	1490	1.0	-138.6	1.69
ML3-4	22-Aug-06	4.50	8:06 AM	0.160	--	--	--	--	--	--
			8:22 AM		26.1	6.1	808	2.0	-149.1	192.00
			8:25 AM		26.4	6.2	791	2.1	-140.3	125.00
ML3-5	22-Aug-06	4.50	2:37 PM	0.120	--	--	--	--	--	--
			2:46 PM		26.7	6.0	538	0.7	-95.0	1.66
			2:50 PM		26.5	5.9	519	0.7	-93.1	1.06
ML3-6	22-Aug-06	4.50	8:54 AM	0.135	--	--	--	--	--	--
			9:04 AM		25.8	6.3	766	1.4	-175.9	29.10
			9:08 AM		25.4	6.3	753	1.5	-179.4	24.70
ML4-2	22-Aug-06	4.50	10:27 AM	0.030	--	--	--	--	--	--
			10:52 AM		30.1	6.4	2460	2.1	-100.3	24.70
			11:00 AM		30.2	6.4	2450	2.0	-107.6	16.20
ML4-2	24-Aug-06	4.50	11:10 AM	0.030	--	--	--	--	--	--
			11:32 AM		28.0	6.2	2450	2.5	-79.2	turbid
ML4-4	24-Aug-06	4.50	12:06 PM	0.150	--	--	--	--	--	--
			12:16 PM		26.1	6.3	1333	0.7	-94.0	clear
ML4-6	24-Aug-06	4.50	12:31 PM	0.150	--	--	--	--	--	--
			12:39 PM		25.6	6.2	1211	0.5	-96.8	clear
			12:46 PM		25.4	6.2	1175	0.5	-97.5	clear
ML5-2	23-Aug-06	4.50	7:41 AM	0.031	--	--	--	--	--	--
			8:05 AM		27.8	6.2	2230	3.3	-83.9	17.30
ML5-3	23-Aug-06	4.50	8:39 AM	0.140	--	--	--	--	--	--
			8:48 AM		27.4	6.3	1681	2.5	-106.1	19.30
ML5-4	23-Aug-06	4.50	9:05 AM	0.140	--	--	--	--	--	--
			9:18 AM		26.3	6.4	1625	2.4	-105.8	31.70
ML5-5	23-Aug-06	4.50	9:34 AM	0.140	--	--	--	--	--	--
			9:44 AM		26.1	6.6	1708	2.1	-121.1	121.00
			9:49 AM		25.9	6.6	1656	2.1	-120.9	36.20
ML5-6	23-Aug-06	4.50	10:09 AM	0.140	--	--	--	--	--	--
			10:21 AM		26.6	6.3	1471	2.1	-124.6	13.10
			10:25 AM		26.7	6.3	1469	2.1	-122.3	14.10
ML5-7	23-Aug-06	4.50	11:02 AM	0.150	--	--	--	--	--	--
			11:10 AM		26.2	6.5	1698	1.9	-149.5	5.61
			11:19 AM		25.8	6.5	1616	1.8	-153.4	4.41
ML6-2	24-Aug-06	4.50	9:18 AM	0.030	--	--	--	--	--	--
			9:38 AM		27.5	6.1	1688	2.6	-67.8	turbid
ML6-4	24-Aug-06	4.50	10:12 AM	0.150	--	--	--	--	--	--
			10:22 AM		25.5	6.4	2430	0.6	-113.9	turbid

TABLE E-12: AUGUST 2006 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well ID.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (meter)	ORP (mV)	Turbidity (NTU)
ML6-6	24-Aug-06	4.50	10:37 AM	0.150	--	--	--	--	--	--
			10:43 AM		25.1	6.0	952	0.5	-35.5	turbid
			10:49 AM		24.9	6.0	925	0.5	-48.5	turbid
ML7-2	23-Aug-06	4.50	11:53 AM	0.030	--	--	--	--	--	--
			12:32 PM		37.2	6.2	3120	2.5	-102.4	36.10
ML7-3	23-Aug-06	4.50	2:01 PM	0.030	--	--	--	--	--	--
			2:25 PM		37.4	6.3	37	1.9	-119.4	144.00
ML7-4	23-Aug-06	4.50	2:57 PM	0.150	--	--	--	--	--	--
			3:05 PM		27.5	6.2	2150	0.6	-98.6	102.00
			3:12 PM		27.2	6.3	2110	0.6	-101.3	8.44
ML7-5	23-Aug-06	4.50	3:30 PM	0.150	--	--	--	--	--	--
			3:40 PM		26.4	6.3	1639	0.4	-85.7	4.26
			3:45 PM		26.3	6.3	1471	0.4	-80.7	1.80
ML7-6	23-Aug-06	4.50	4:29 PM	0.150	--	--	--	--	--	--
			4:38 PM		25.2	6.3	1988	1.1	-105.9	3.42
			4:45 PM		24.9	6.3	2060	0.8	-109.9	2.81
	24-Aug-06	4.50	7:49 AM	0.150	--	--	--	--	--	--
			8:01 AM		24.4	6.5	2290	1.2	-106.0	clear
ML7-7	24-Aug-06	4.50	8:24 AM	0.150	--	--	--	--	--	--
			8:37 AM		24.1	6.2	2130	1.0	-120.4	clear
			8:42 AM		24.0	6.3	2310	0.9	-132.4	clear

Notes:

ft btoc - feet below top of casing
Lpm - liters per minute
°C - degrees Celsius
µS/cm - microsiemens per centimeter
mg/L - milligrams per litre
mV - millivolts
NTU - nephelometric turbidity units
-- - not recorded/measured

TABLE E-13: OCTOBER 2006 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water ¹ (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (meter)	ORP (mV)	Turbidity (NTU)
PMW-1	4-Oct-06	2.90	9:22 AM	0.230	--	--	--	--	--	--
			9:31 AM	0.230	27.1	6.2	758	1.6	-119.8	1000.00
			9:45 AM	0.230	27.9	6.3	791	1.9	-130.1	130.00
			9:55 AM	0.230	28.3	6.3	820	1.8	-132.4	269.00
			10:05 AM	0.230	28.4	6.3	826	1.7	-132.2	69.90
			10:18 AM	0.230	28.7	6.3	830	1.5	-135.8	84.40
PMW-2	4-Oct-06	3.04	10:31 AM	--	--	--	--	--	--	--
			10:42 AM	--	26.0	6.2	1225	1.2	-18.4	51.60
			10:57 AM	--	26.0	6.2	1025	1.2	-34.2	17.30
			11:08 AM	--	25.9	6.2	941	1.1	-34.5	9.76
			11:22 AM	--	25.8	6.2	915	1.1	-39.9	6.77
			11:30 AM	--	25.9	6.2	949	1.1	-41.6	7.02
PMW-3	5-Oct-06	--	1:10 PM	--	--	--	--	--	--	--
			1:20 PM	--	25.9	5.8	661	1.8	-26.7	297.00
			1:40 PM	--	25.5	5.9	564	1.4	-34.2	76.90
			1:50 PM	--	25.8	6.0	615	1.3	-52.2	40.00
			2:00 PM	--	25.7	6.0	636	1.1	-59.7	18.40
PMW-4	4-Oct-06	2.90	11:47 AM	--	--	--	--	--	--	--
			11:51 AM	--	25.9	5.6	1004	1.3	37.0	66.80
			12:03 PM	--	26.1	5.6	989	0.9	28.7	43.70
			12:15 PM	--	26.2	5.6	980	1.0	35.6	7.37
			12:25 PM	--	26.2	5.6	887	0.9	29.6	3.39
			12:35 PM	--	25.8	5.6	795	0.8	22.4	2.01
PMW-5	5-Oct-06	--	1:48 PM	--	--	--	--	--	--	--
			2:00 PM	--	25.7	6.1	1020	1.1	62.0	14.80
			2:32 PM	--	25.7	6.1	946	1.1	58.2	2.59
			2:42 PM	--	25.7	6.1	941	1.1	26.7	1.86
PMW-6	4-Oct-06	--	12:50 PM	--	--	--	--	--	--	--
			1:00 PM	--	26.5	6.4	1168	1.2	-35.1	16.80
			1:11 PM	--	25.7	6.4	1133	0.7	-40.9	13.50
			1:21 PM	--	25.8	6.3	1031	0.6	-20.5	9.49
			1:40 PM	--	25.7	6.3	885	0.6	-22.1	2.97
			1:50 PM	--	25.7	6.2	853	0.6	-25.7	2.03
ML1-2	4-Oct-06	--	2:38 PM	0.050	--	--	--	--	--	--
			2:50 PM	--	28.6	6.4	1228	0.7	-79.5	88.50
ML1-3	4-Oct-06	--	3:14 PM	--	--	--	--	--	--	--
			3:21 PM	--	26.6	6.6	1884	0.8	-82.8	117.00
			3:25 PM	--	26.6	6.6	1848	0.6	-90.3	72.80
ML1-5	4-Oct-06	--	3:40 PM	--	--	--	--	--	--	--
			3:48 PM	--	26.0	6.8	2500	0.7	-94.8	127.00
			3:58 PM	--	26.1	6.8	2400	0.5	-99.5	73.10
ML1-7	4-Oct-06	--	4:07 PM	--	--	--	--	--	--	--
			4:17 PM	--	24.9	6.6	1710	0.5	-97.8	7.36
			4:22 PM	--	24.7	6.6	1676	0.4	-100.0	5.90
ML3-5	4-Oct-06	--	4:38 PM	--	--	--	--	--	--	--
			4:48 PM	--	25.5	6.2	525	0.6	-23.6	4.98
			4:57 PM	--	25.4	6.1	524	0.5	-27.4	3.83
ML3-7	4-Oct-06	--	5:07 PM	--	--	--	--	--	--	--
			5:15 PM	--	24.8	6.4	706	0.8	-48.7	2.55
			5:20 PM	--	24.7	6.4	704	0.5	-63.2	1.41
ML4-3	4-Oct-06	--	5:35 PM	--	--	--	--	--	--	--
			5:43 PM	--	26.2	6.4	1069	0.9	-74.4	1.91
			5:47 PM	--	26.2	6.3	1020	0.7	-74.4	<1.91
ML4-5	4-Oct-06	--	5:57 PM	--	--	--	--	--	--	--
			6:05 PM	--	25.4	6.6	1217	0.7	-64.2	4.77
			6:10 PM	--	25.2	6.5	1152	0.4	-61.0	2.97
ML4-7	4-Oct-06	--	6:20 PM	--	--	--	--	--	--	--
			6:30 PM	--	24.1	6.6	1644	0.6	-82.0	1.04
			6:35 PM	--	24.0	6.6	1626	0.8	-90.3	1.02
ML3-7	5-Oct-06	--	5:07 AM	--	--	--	--	--	--	--
			5:15 AM	--	24.8	6.4	1069	0.9	-74.4	2.55
			5:20 AM	--	24.7	6.4	1020	0.7	-74.4	1.41
ML4-3	5-Oct-06	--	5:35 AM	--	--	--	--	--	--	--
			5:43 AM	--	26.2	6.4	1069	0.9	-74.4	1.91
			5:47 AM	--	26.2	6.3	1020	0.7	-74.4	<1.91
ML4-5	5-Oct-06	--	5:57 AM	--	--	--	--	--	--	--
			6:15 AM	--	25.4	6.6	1217	0.7	-64.2	4.77
			6:10 AM	--	25.2	6.5	1152	0.4	-61.0	2.97
ML5-3	5-Oct-06	--	8:20 AM	--	--	--	--	--	--	--
			8:41 AM	--	25.1	6.1	1136	2.1	66.7	7.72
			8:45 AM	--	25.1	6.1	1151	2.1	63.0	2.44
ML5-5	5-Oct-06	--	9:29 AM	--	--	--	--	--	--	--
			9:36 AM	--	25.4	6.5	1082	1.2	58.5	5.55
			9:40 AM	--	25.4	6.4	1032	1.1	62.8	2.56

TABLE E-13: OCTOBER 2006 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water ¹ (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (meter)	ORP (mV)	Turbidity (NTU)
ML6-3	5-Oct-06	--	10:14 AM	--	--	--	--	--	--	--
			10:20 AM		26.1	6.3	957	1.2	70.2	4.17
			10:24 AM		26.1	6.3	977	1.1	73.3	2.10
ML6-5	5-Oct-06	--	10:36 AM	--	--	--	--	--	--	--
			10:44 AM		25.6	6.4	931	1.0	83.7	177.00
			10:24 AM		25.6	6.3	851	1.0	84.5	51.50
ML6-7	5-Oct-06	--	11:05 AM	--	--	--	--	--	--	--
			11:16 AM		26.3	6.5	1393	1.1	44.7	31.80
			11:21 AM		25.7	6.4	1351	1.0	51.5	4.74
ML7-3	5-Oct-06	--	11:42 AM	--	--	--	--	--	--	--
			11:45 AM		26.3	6.5	2160	1.2	56.2	20.50
			11:48 AM		26.2	6.5	2160	1.3	61.7	3.53
ML7-5	5-Oct-06	--	12:01 PM	--	--	--	--	--	--	--
			12:08 PM		25.3	6.2	568	1.0	68.3	6.33
			12:14 PM		25.3	6.3	680	0.9	68.0	3.71
ML2-3	5-Oct-06	--	3:18 PM	--	--	--	--	--	--	--
			3:26 PM		26.8	6.4	1791	1.0	52.7	15.00
			3:30 PM		26.8	6.4	1808	1.0	55.4	8.35
ML2-5	5-Oct-06	--	4:14 PM	--	--	--	--	--	--	--
			4:22 PM		26.1	6.5	872	0.8	70.8	68.2
			4:31 PM		25.7	6.4	761	0.6	74.0	9.03
ML2-7	5-Oct-06	--	5:13 PM	--	--	--	--	--	--	--
			5:22 PM		25.0	6.4	1200	0.8	81.0	3.24
			5:28 PM		25.0	6.6	2190	0.5	81.9	2.71

Notes:

ft btoc - feet below top of casing

Lpm - liters per minute

°C - degrees Celsius

µS/cm - microsiemens per centimeter

mg/L - milligrams per litre

mV - millivolts

NTU - nephelometric turbidity units

-- - not recorded/measured

TABLE E-14: NOVEMBER 2006 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (meter)	ORP (mV)	Turbidity (NTU)
PMW-1	30-Nov-06	2.82	2:26 PM	0.370	--	--	--	--	--	--
			2:29 PM		23.1	5.91	799	0.45	-34.9	17.30
			2:34 PM		22.4	5.89	828	0.08	-55.0	33.00
			2:50 PM		22.1	5.93	786	0.00	-71.2	38.70
			3:18 PM		22.5	6.05	698	0.06	-90.3	26.30
			3:40 PM		22.2	6.09	679	0.02	-94.6	36.30
PMW-2	30-Nov-06	2.70	9:05 AM	0.330	--	--	--	--	--	--
			9:14 AM		23.1	6.25	888	2.24	-58.8	11.20
			9:40 AM		23.9	6.12	698	0.39	-65.7	7.04
			10:00 AM		23.4	6.10	642	0.37	-61.2	5.63
			10:21 AM		24.2	6.09	596	0.39	-52.8	10.30
			10:45 AM		23.5	6.09	576	0.38	-57.7	2.73
PMW-3	29-Nov-06	2.79	8:00 AM	0.340	--	--	--	--	--	--
			8:40 AM		21.9	5.80	461	1.84	-9.7	3.96
			9:01 AM		22.5	5.80	409	1.60	-27.4	2.79
			9:20 AM		22.9	5.82	406	1.36	-33.4	1.67
			9:40 AM		22.9	5.84	410	1.18	-38.4	1.38
			9:55 AM		23.1	5.84	419	1.05	-41.9	1.19
PMW-4	1-Dec-06	2.64	8:20 AM	0.370	--	--	--	--	--	--
			8:28 AM		22.3	5.57	809	0.84	29.5	17.20
			8:45 AM		22.4	5.64	777	0.71	19.8	8.27
			9:11 AM		22.5	5.66	684	0.64	15.1	3.81
			9:32 AM		22.7	5.66	639	0.73	12.2	2.30
PMW-5	2-Dec-06	2.62	9:38 AM	--	--	--	--	--	--	--
			9:41 AM		22.3	5.69	401	0.29	42.9	10.30
			10:06 AM		23.1	5.71	205	0.43	-11.9	10.90
			10:25 AM		23.4	5.73	212	0.43	-33.2	5.28
			10:47 AM		23.7	5.73	274	0.44	-58.6	6.71
			11:00 AM		23.7	5.75	346	0.41	-73.8	3.69
PMW-6	2-Dec-06	2.64	1:06 PM	--	--	--	--	--	--	--
			1:18 PM		23.2	5.75	495	0.91	59.9	6.13
			1:35 PM		23.1	5.96	284	0.66	32.8	4.46
			1:55 PM		23.3	6.04	215	0.54	15.7	6.26
			2:15 PM		23.3	6.06	202	0.47	4.9	5.86
			2:38 PM		23.3	6.06	199.7	0.48	-7.1	4.76
ML1-3	30-Nov-06	--	11:52 AM	0.140	--	--	--	--	--	--
			11:57 AM		25.6	6.61	1477	0.85	-74.1	51.6
			12:04 PM		24.3	6.59	1467	0.30	-85.3	35.6
			12:08 PM		24.0	6.59	1454	0.24	-89.3	12.9
ML1-5	30-Nov-06	--	12:40 PM	0.140	--	--	--	--	--	--
			12:44 PM		24.8	6.71	1269	0.69	-40.1	1.6
			12:49 PM		24.4	6.64	1186	0.41	-59.3	79.9
			12:55 PM		24.1	6.60	1117	0.24	-63.9	38.2
ML1-7	30-Nov-06	--	1:30 PM	0.140	--	--	--	--	--	--
			1:34 PM		24.5	6.56	1133	1.12	-43.3	10.10
			1:39 PM		24.1	6.53	1107	0.36	-56.5	3.09
			1:43 PM		24.2	6.49	1050	0.30	-62.4	2.19
ML3-3	4-Dec-06	--	10:10 AM	0.090	--	--	--	--	--	--
			11:22 AM		16.8	6.38	405	0.00	-83.8	26.10
			11:37 AM		17.8	6.35	318	0.00	-91.4	24.20
			11:42 AM		18.1	6.35	296	0.00	-94.8	22.80
ML3-5	4-Dec-06	--	2:45 PM	0.120	--	--	--	--	--	--
			2:49 PM		23.2	5.61	421.0	0.61	-25.2	75.1
			2:55 PM		23.1	5.62	305	0.49	-27.6	113
			3:05 PM		23.7	5.64	286.1	0.42	-26.9	58.4
ML3-7	4-Dec-06	--	4:02 PM	0.120	--	--	--	--	--	--
			4:07 PM		21.1	5.66	584	0.19	9.8	2.51
			4:15 PM		21.9	5.56	322	0.20	6.3	8.75
ML4-3	29-Nov-06	--	4:40 PM	0.140	--	--	--	--	--	--
			4:43 PM		22.2	6.36	843	1.40	-70.6	12.3
			4:48 PM		22.4	6.36	840	0.81	-72.4	4.85
			4:52 PM		22.4	6.34	833	0.66	-73.6	2.52
ML4-5	29-Nov-06	--	5:24 PM	0.140	--	--	--	--	--	--
			5:28 PM		22.3	6.44	606	3.68	19.0	48.5
			5:31 PM		22.6	6.44	594	1.53	-23.1	25.7
			5:35 PM		22.6	6.40	573	1.41	-24.1	13.3
ML4-7	30-Nov-06	--	8:15 AM	0.120	--	--	--	--	--	--
			8:20 AM		22.1	6.24	818	2.64	-91.3	7.7
			8:26 AM		22.4	6.24	730	0.84	-118.1	2.45
			8:35 AM		22.5	6.24	727	0.75	-122.8	2.88
ML5-3	29-Nov-06	--	1:57 PM	0.140	--	--	--	--	--	--
			2:00 PM		24.0	6.41	1154	0.84	-92.4	22.5
			2:03 PM		23.8	6.39	1158	0.52	-95.5	58.3
			2:07 PM		23.6	6.43	1215	0.48	-101.1	17.0
ML5-5	29-Nov-06	--	2:51 PM	0.140	--	--	--	--	--	--
			2:55 PM		24.0	6.14	625	0.73	-41.2	15.10
			2:59 PM		23.8	6.08	600	0.46	-47.0	73.10
			3:03 PM		23.7	6.04	591	0.37	-49.9	25.30

TABLE E-14: NOVEMBER 2006 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (meter)	ORP (mV)	Turbidity (NTU)
ML5-7	29-Nov-06	--	3:45 PM	0.140	--	--	--	--	--	--
			3:48 PM		23.4	6.37	842	0.60	-43.8	9.11
			3:52 PM		23.1	6.31	772	0.36	-67.5	3.69
			3:58 PM		23.0	6.29	743	0.25	-79.7	1.34
ML6-3	29-Nov-06	--	10:42 AM	0.140	--	--	--	--	--	--
			10:47 AM		23.6	6.30	978	0.90	-55.5	43.80
			10:54 AM		23.4	6.30	995	0.36	-61.8	4.91
			10:57 AM		23.4	6.30	996	0.34	-65.4	2.58
ML6-5	29-Nov-06	--	11:28 AM	0.140	--	--	--	--	--	--
			11:31 AM		24.3	6.18	752	3.40	-23.4	1.76
			11:40 AM		24.3	6.04	698	1.71	-47.5	113
			11:50 AM		24.1	6.02	697	0.94	-56.7	37.90
ML6-7	29-Nov-06	--	1:04 PM	0.140	--	--	--	--	--	--
			1:10 PM		24.3	6.51	1219	1.52	-71.8	6.4
			1:18 PM		24.1	6.45	1108	1.20	-91.1	1.48
			1:22 PM		24.2	6.41	1031	1.13	-93.4	0.98
ML7-3	2-Dec-06	--	3:21 PM	--	--	--	--	--	--	--
			3:54 PM		21.9	6.34	311	0.18	38.5	141
			4:03 PM		21.5	6.34	194	0.17	37.7	87.7
			4:18 PM		19.9	6.36	401	0.13	36.7	99.0
ML7-5	4-Dec-06	--	8:10 AM	0.120	--	--	--	--	--	--
			8:16 AM		19.5	5.62	752	0.82	53.9	50.7
			8:23 AM		18.9	5.70	620	0.55	51.7	5.81
			8:30 AM		19.6	5.75	558	0.53	52.5	20.7
ML7-7	4-Dec-06	--	9:05 AM	0.120	--	--	--	--	--	--
			9:11 AM		19.4	6.24	434	0.02	29.0	7.21
			9:20 AM		20.8	6.30	269	0.28	9.9	5.45
			9:25 AM		21.2	6.36	258	0.30	3.3	3.33
ML2-3	1-Dec-06	--	11:55 AM	--	--	--	--	--	--	--
			12:29 PM		28.2	5.70	3280	0.30	-66.2	37.30
			12:45 PM		27.8	5.72	3410	0.14	-71.4	32.60
			1:00 PM		27.6	5.74	3780	0.09	-77.0	38.30
ML2-5	1-Dec-06	--	3:20 PM	--	--	--	--	--	--	--
			3:38 PM		22.9	6.27	638	2.53	17.1	174
			3:54 PM		22.8	6.25	741	0.48	12.6	54.5
			4:10 PM		23.4	6.17	691	0.02	14.1	5.74
ML2-7	2-Dec-06	--	8:21 AM	--	--	--	--	--	--	--
			8:27 AM		20.7	6.19	599	1.13	65.8	8.66
			8:35 AM		21.1	6.21	603	0.59	59.4	3.37
			8:45 AM		21.3	6.37	734	0.59	48.7	2.84

Notes:

ft btoc - feet below top of casing
Lpm - liters per minute
°C - degrees Celsius
µS/cm - microsiemens per centimeter
mg/L - milligrams per litre
mV - millivolts
NTU - nephelometric turbidity units
-- - not recorded/measured

TABLE E-15: JANUARY 2007 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (meter)	ORP (mV)	Turbidity (NTU)
PMW-1	19-Jan-07	2.43	3:31 PM	0.400	--	--	--	--	--	--
			3:35 PM		19.8	5.88	445	5.01	-92.1	16.10
			3:53 PM		19.5	5.80	412	0.17	-134.6	24.50
			4:14 PM		19.8	5.86	414	0.15	-131.8	7.48
			4:35 PM		19.5	5.92	391	0.16	-148.1	3.13
PMW-3	19-Jan-07	2.00	4:45 PM	0.410	19.5	5.92	391	0.16	-146.0	3.22
			8:39 AM		--	--	--	--	--	--
			8:43 AM		19.7	5.88	407	3.00	-87.6	6.21
			9:07 AM		20.3	5.66	249	1.83	-102.8	2.81
			9:39 AM		20.5	5.64	286	1.41	-120.9	2.02
PMW-5	19-Jan-07	3.20	10:02 AM	0.440	20.5	5.64	406	1.22	-141.2	1.80
			10:16 AM		20.6	5.62	404	1.15	-135.8	1.54
			10:54 AM		--	--	--	--	--	--
			10:57 AM		20.0	5.43	834	5.16	-5.9	5.89
			11:12 AM		20.3	5.33	693	0.59	-4.0	4.01
PMW-6	19-Jan-07	3.42	11:30 AM	0.400	20.6	5.27	642	0.53	-2.2	2.19
			11:48 AM		20.7	5.27	603	0.47	-1.7	1.69
			12:12 PM		20.7	5.27	554	0.41	-95.6	1.20
			1:30 PM		--	--	--	--	--	--
			1:40 PM		19.4	6.09	475	1.31	-153.7	5.16
ML1-2	20-Jan-07	--	1:59 PM	0.400	20.6	6.05	461	0.52	-191.2	2.07
			2:20 PM		20.8	6.03	456	0.34	-184.7	1.56
			2:40 PM		21.0	6.01	433	0.29	-203.8	1.61
			2:54 PM		21.0	6.01	424	0.29	-199.7	1.69
			8:27 AM	0.010	--	--	--	--	--	--
ML1-4	20-Jan-07	--	9:23 AM		8.8	6.21	273	3.59	-59.0	52.9
			9:35 AM		8.8	6.20	273	2.10	-48.4	32.3
			9:40 AM		8.9	6.20	252	1.68	-45.4	33.3
			11:22 AM	0.120	--	--	--	--	--	--
ML1-6	20-Jan-07	--	11:25 AM		19.2	6.65	490	5.63	13.6	10.1
			11:30 AM		19.9	6.57	428	2.32	0.8	5.4
			11:35 AM		20.5	6.51	357	0.99	14.1	3.7
			12:00 PM	0.120	--	--	--	--	--	--
ML2-2	20-Jan-07	--	12:05 PM		20.7	6.75	457	3.37	94.5	2.56
			12:10 PM		20.5	6.67	416	1.90	116.9	1.98
			12:15 PM		21.0	6.65	404	1.68	126.0	1.54
			12:46 PM	0.010	--	--	--	--	--	--
ML2-3	20-Jan-07	--	1:40 PM		18.8	5.91	614	4.29	114.2	24.0
			1:50 PM		18.9	5.87	466	6.75	122.8	23.3
			1:55 PM		19.0	5.87	462	3.59	131.4	21.5
			3:43 PM	0.010	--	--	--	--	--	--
ML2-4	20-Jan-07	--	4:35 PM		15.3	6.09	2230	4.50	-34.0	27.1
			4:48 PM		15.8	6.07	2149	3.39	-88.6	26
			4:57 PM		15.4	6.09	2188	2.56	-113.4	25.3
			8:18 AM	0.150	--	--	--	--	--	--
ML2-5	21-Jan-07	--	8:27 AM		17.2	6.16	787	2.26	14.5	10.0
			8:35 AM		18.2	6.20	719	1.97	0.4	4.80
			8:40 AM		18.5	6.20	678	1.96	-3.6	2.98
			9:04 AM	0.150	--	--	--	--	--	--
ML2-6	21-Jan-07	--	9:11 AM		17.2	6.29	380	1.93	21.6	29.6
			9:18 AM		18.9	6.27	304	1.13	22.9	18.9
			9:25 AM		19.2	6.23	296	0.91	29.2	7.49
			10:04 AM	0.150	--	--	--	--	--	--
ML3-2	21-Jan-07	--	10:11 AM		19.7	6.41	428	3.18	149.2	17.3
			10:17 AM		20.1	6.35	413	1.84	153.4	5.7
			10:25 AM		20.4	6.33	372	1.43	158.4	3.7
			10:58 AM	0.060	--	--	--	--	--	--
ML3-3	21-Jan-07	--	11:44 AM		17.9	6.74	1845	0.18	-367.4	112
			11:53 AM		18.5	6.76	1822	0.13	-346.7	106
			11:57 AM		18.5	6.76	1727	0.11	-360.4	102
			1:44 PM	0.010	--	--	--	--	--	--
ML3-4	21-Jan-07	--	2:26 PM		18.6	6.12	1620	0.20	-250.4	52.5
			2:33 PM		18.6	6.08	1431	0.18	-275.4	36.8
			2:40 PM		18.4	6.08	1021	0.15	-287.9	39.7
			4:32 PM	0.150	--	--	--	--	--	--
ML3-7	21-Jan-07	--	4:38 PM		19.6	5.71	503	2.20	-2.3	30.0
			4:42 PM		20.0	5.67	476	0.80	-19.4	24.2
			4:45 PM		20.2	5.65	459	0.60	-38.2	43.2
			8:19 AM	0.015	--	--	--	--	--	--
ML4-2	22-Jan-07	--	8:28 AM		19.7	5.51	885	2.20	67.7	17.1
			8:35 AM		20.4	5.75	759	2.36	44.2	12.9
			8:45 AM		20.7	6.05	637	2.19	17.3	9.3
			11:10 AM	0.010	--	--	--	--	--	--
ML4-4	22-Jan-07	--	12:12 PM		14.2	6.83	961	2.34	105.8	5.58
			12:19 PM		14.4	6.85	874	0.73	108.6	5.90
			12:25 PM		14.3	6.87	802	0.47	113.5	4.26
			8:34 AM	0.150	--	--	--	--	--	--
ML4-4	23-Jan-07	--	8:45 AM		17.6	6.19	640	1.99	-18.1	26.3
			8:50 AM		17.5	6.19	601	1.48	-20.6	23.3
			8:54 AM		17.9	6.21	578	1.49	19.9	10.8

TABLE E-15: JANUARY 2007 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (meter)	ORP (mV)	Turbidity (NTU)
ML4-6	23-Jan-07	--	9:18 AM	0.150	--	--	--	--	--	--
			9:26 AM		19.0	6.20	492	1.88	-26.6	8.3
			9:31 AM		19.0	6.20	421	1.36	-24.6	6.34
			9:37 AM		19.3	6.20	391	1.18	-22.3	5.88
ML5-2	23-Jan-07	--	10:07 AM	0.010	--	--	--	--	--	--
			10:56 AM		11.9	6.19	1342	1.22	17.1	44.7
			11:00 AM		11.7	6.19	1275	1.17	17.9	39.7
			11:05 AM		11.5	6.19	1270	1.15	15.7	18.8
ML5-4	23-Jan-07	--	1:30 PM	0.150	--	--	--	--	--	--
			1:38 PM		18.2	5.51	745	2.26	-81.0	12.4
ML5-6	23-Jan-07	--	1:45 PM	0.150	19.2	5.43	692	1.16	-97.3	7.7
			2:31 PM		--	--	--	--	--	--
			2:39 PM		19.6	6.02	560	2.16	-73.2	17.50
			2:45 PM		19.8	6.00	551	0.90	-79.4	11.60
ML6-2	23-Jan-07	--	2:50 PM	0.010	19.9	6.00	542	0.68	-87.3	8.86
			3:22 PM		--	--	--	--	--	--
			4:31 PM		13.4	6.43	1090	0.78	-24.4	33.80
			4:36 PM		13.2	6.43	1093	0.90	-24.7	13.70
ML6-4	24-Jan-07	--	4:41 PM	0.150	12.9	6.46	1070	0.93	-25.5	8.60
			8:16 AM		--	--	--	--	--	--
			8:25 AM		17.4	6.18	359	2.69	-2.0	58.2
			8:30 AM		17.4	6.24	353	1.80	-23.7	28.4
ML6-6	24-Jan-07	--	8:35 AM	0.150	17.4	6.35	347	1.71	-37.1	17.50
			9:04 AM		--	--	--	--	--	--
			9:15 AM		16.6	6.11	574	2.28	-51.0	13.40
			9:20 AM		19.2	6.11	470	1.89	-53.8	8.05
ML7-2	24-Jan-07	--	9:26 AM	0.010	20.1	6.13	555	1.42	-68.5	7.33
			9:58 AM		--	--	--	--	--	--
			10:48 AM		12.8	5.62	1405	0.30	-37.4	199.0
			10:55 AM		13.0	5.60	1540	0.27	-42.5	118.0
ML7-3	24-Jan-07	--	11:00 AM	0.010	13.0	5.60	1442	0.21	-43.2	68.0
			12:54 PM		--	--	--	--	--	--
			1:39 PM		13.5	6.17	1098	1.78	81.2	103.0
			1:44 PM		14.5	6.19	1033	1.39	78.8	61.5
ML7-4	24-Jan-07	--	1:51 PM	0.150	15.0	6.23	891	1.19	78.1	253.0
			3:48 PM		--	--	--	--	--	--
			3:51 PM		18.0	6.36	432	1.59	-35.7	62.9
			4:00 PM		18.4	6.36	420	0.56	-25.7	12.4
ML7-5	25-Jan-07	--	4:05 PM	0.150	18.5	6.36	416	0.52	-11.5	4.4
			8:31 AM		--	--	--	--	--	--
			8:39 AM		18.4	5.55	417	2.35	88.0	2.84
			8:45 AM		17.8	5.59	423	1.50	89.4	1.26
ML7-6	25-Jan-07	--	8:50 AM	0.150	17.8	5.61	397	1.51	89.0	0.73
			9:21 AM		--	--	--	--	--	--
			9:27 AM		18.5	5.95	494	1.94	49.2	10.40
			9:35 AM		18.9	6.03	434	0.90	3.1	3.58
ML7-7	25-Jan-07	--	9:42 AM	0.150	19.3	6.12	418	0.82	-27.6	2.06
			10:39 AM		--	--	--	--	--	--
			10:50 AM		18.9	6.64	675	0.99	-37.9	6.04
			10:56 AM		20.9	6.78	791	0.69	-35.5	3.10
			11:05 AM		20.3	6.78	630	0.63	-52.1	2.48

Notes:

ft btoc - feet below top of casing
Lpm - liters per minute
°C - degrees Celsius
µS/cm - microsiemens per centimeter
mg/L - milligrams per litre
mV - millivolts
NTU - nephelometric turbidity units
-- - not recorded/measured

TABLE E-16: MARCH 2007 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (meter)	ORP (mV)	Turbidity (NTU)
PMW-1	26-Mar-07	3.22	9:53 AM	0.430	--	--	--	--	--	--
			9:56 AM		19.4	5.73	455	0.94	23.6	46.10
			10:12 AM		19.4	5.79	527	0.36	-9.7	2.40
			10:37 AM		20.5	5.49	491	0.39	-51.7	12.40
PMW-2	26-Mar-07	3.15	10:46 AM	0.420	20.5	5.99	477	0.41	-88.5	17.00
			8:07 AM		--	--	--	--	--	--
			8:10 AM		19.2	5.94	623	1.88	-15.2	4.02
			8:31 AM		19.0	6.12	455	0.33	-50.0	5.05
PMW-3	21-Mar-07	3.25	8:54 AM	0.350	19.2	6.08	416	0.35	-56.3	2.91
			9:16 AM		19.3	6.06	390	0.33	-60.9	1.53
			9:38 AM		19.3	6.04	377	0.32	-64.6	2.33
			9:54 AM		--	--	--	--	--	--
PMW-4	21-Mar-07	3.12	10:12 AM	0.400	19.2	5.46	472	0.61	-27.8	1.88
			10:57 AM		--	--	--	--	--	--
			11:02 AM		20.3	5.84	621	0.66	-11.2	9.16
			11:19 AM		18.9	5.82	582	0.23	-11.5	7.91
PMW-5	21-Mar-07	3.34	11:40 AM	0.480	19.1	5.83	434	0.18	-10.7	5.50
			12:01 PM		19.2	5.81	563	0.16	-10.9	3.78
			12:22 PM		19.2	5.81	535	0.13	-24.1	3.24
			--		--	--	--	--	--	--
PMW-6	21-Mar-07	3.12	1:52 PM	0.400	19.6	5.37	691	1.78	-14.2	8.09
			1:55 PM		19.2	5.29	877	0.87	-10.8	1.95
			2:09 PM		19.2	5.27	664	0.59	-12.2	1.59
			3:34 AM		19.6	5.23	490	0.38	-16.2	1.65
PMW-7	21-Mar-07	3.12	2:50 PM	0.400	19.6	5.21	423	0.19	-24.6	1.31
			3:08 PM		--	--	--	--	--	--
			4:00 PM		19.9	6.06	760	0.42	2.7	6.46
			4:03 PM		19.3	6.10	516	0.11	-41.4	2.46
ML1-3	24-Mar-07	3.00	4:25 PM	0.180	19.3	6.08	440	0.12	-34.9	1.58
			4:45 PM		19.3	6.06	431	0.17	-13.8	1.05
			5:05 PM		19.3	6.04	412	0.17	-12.6	0.96
			5:19 PM		--	--	--	--	--	--
ML1-5	24-Mar-07	3.00	9:03 AM	0.150	19.0	6.55	984	1.03	-19.4	12.30
			9:07 AM		18.7	6.49	897	0.57	-42.2	9.92
			9:11 AM		18.6	6.49	828	0.36	-51.9	8.18
			9:15 AM		--	--	--	--	--	--
ML1-7	24-Mar-07	3.00	10:46 AM	0.130	21.6	6.88	514	0.87	-20.6	15.90
			10:50 AM		20.9	6.64	514	0.23	-53.5	4.05
			10:55 AM		20.7	6.6	501	0.16	-64.3	5.84
			11:00 AM		--	--	--	--	--	--
ML2-3	22-Mar-07	3.00	12:28 PM	0.1030	25.5	6.51	942	0.69	-59.9	5.43
			12:35 PM		23.1	6.45	804	0.22	-67.7	1.76
			12:42 PM		23.2	6.41	756	0.18	-69.2	1.27
			12:47 PM		--	--	--	--	--	--
ML2-5	22-Mar-07	3.00	8:22 AM	0.150	18.9	5.64	749	1.30	-78.9	8.95
			9:23 AM		18.9	5.80	258	1.48	-75.2	12.70
			9:37 AM		19.0	5.78	666	1.39	-98.9	16.3
			9:48 AM		--	--	--	--	--	--
ML2-7	22-Mar-07	3.00	4:47 PM	0.150	20.2	6.32	448	1.14	100.6	20.80
			4:52 PM		20.3	6.29	414	0.79	77.8	5.49
			4:57 PM		20.2	6.25	402	0.82	77.1	3.63
			5:02 PM		--	--	--	--	--	--
ML3-3	26-Mar-07	3.00	5:47 PM	0.150	22.0	6.37	738	2.10	57.7	23.10
			5:55 PM		21.4	6.41	581	0.60	28.9	27.20
			6:00 PM		21.3	6.51	1471	0.54	10.5	20.7
			6:05 PM		--	--	--	--	--	--
ML3-5	22-Mar-07	3.00	11:18 AM	0.025	--	--	--	--	--	--
			12:40 PM		25.9	5.94	2410	0.28	-124.2	224.00
			12:50 PM		25.9	5.94	1995	0.10	-127.4	223.00
			1:05 PM		25.9	5.94	1194	0.1	-126.9	219
ML3-7	27-Mar-07	3.00	8:02 AM	0.120	--	--	--	--	--	--
			8:07 AM		19.6	5.38	1464	0.07	76.7	39.90
			8:10 AM		18.9	5.42	1508	0.20	73.7	14.40
			--		Air bubbles noted in tubing changed to ISMATEC @ 8:16					
ML4-3	23-Mar-07	3.00	8:22 AM	0.090	18.7	5.54	1494	0.23	64.3	31.40
			8:30 AM		18.7	5.60	1385	0.28	48.1	26.2
			9:47 AM		--	--	--	--	--	--
			9:51 AM		20.9	5.96	1563	0.13	-24.1	36.00
ML4-5	23-Mar-07	3.00	10:00 AM	0.110	21.3	6.02	1481	0.12	-51.9	9.54
			10:05 AM		21.7	6.06	1328	0.15	-57.7	8.17
			--		--	--	--	--	--	--
			8:30 AM		18.4	6.20	943	0.50	-12.2	1.77
ML4-7	23-Mar-07	3.00	8:37 AM	0.110	18.2	6.18	705	0.49	3.3	1.99
			8:43 AM		18.2	6.18	629	0.55	4.4	1.53
			8:47 AM		--	--	--	--	--	--
			9:47 AM		20.0	6.25	456	0.81	1.9	8.67
ML4-9	23-Mar-07	3.00	9:52 AM	0.110	19.9	6.21	453	0.49	12.7	4.44
			10:01 AM		19.7	6.21	417	0.45	13.7	2.69
			10:07 AM		--	--	--	--	--	--
			10:48 AM		21.5	6.27	509	1.13	-13.9	5.37
ML4-11	23-Mar-07	3.00	10:52 AM	0.110	21.0	6.27	455	0.19	-23.4	1.56
			11:00 AM		--	--	--	--	--	--
			11:05 AM		21.0	6.27	417	0.2	-33.1	1.45
			--		--	--	--	--	--	--

TABLE E-16: MARCH 2007 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (meter)	ORP (mV)	Turbidity (NTU)
ML5-3	23-Mar-07	3.00	3:24 PM	0.110	--	--	--	--	--	--
			3:27 PM		20.5	6.43	696	0.80	-51.5	8.50
			3:30 PM		19.8	6.43	735	0.14	-60.0	3.38
			3:34 PM		19.6	6.43	751	0.04	-65.8	2.31
ML5-5	23-Mar-07	3.00	4:35 PM	0.110	--	--	--	--	--	--
			4:40 PM		21.2	6.02	562	0.71	-31.5	51.30
			4:45 PM		20.7	5.98	592	0.09	-45.6	10.40
			4:50 PM		20.5	5.96	566	0.00	-66.5	4.2
ML5-7	23-Mar-07	3.00	5:40 PM	0.110	--	--	--	--	--	--
			5:44 PM		21.6	6.07	480	0.60	-46.4	646.00
			5:05 PM		21.2	6.05	453	0.08	-84.4	1.33
			5:55 PM		21.2	6.07	431	0.00	-107.8	-
ML6-3	27-Mar-07	3.00	11:37 AM	0.090	--	--	--	--	--	--
			12:12 PM		27.1	6.45	1018	1.49	-76.3	37.90
			12:17 PM		27.4	6.45	849	1.12	-77.8	28.30
			12:22 PM		27.4	6.45	871	0.87	-80.5	29.2
ML6-5	27-Mar-07	3.00	2:23 PM	0.160	--	--	--	--	--	--
			2:29 PM		23.9	6.36	827	0.23	-57.7	17.90
			2:35 PM		21.3	6.26	774	0.00	-62.2	1.78
			2:40 PM		21.2	6.18	719	0.00	-58.8	0.99
ML6-7	28-Mar-07	3.00	8:59 AM	0.120	--	--	--	--	--	--
			9:05 AM		20.3	5.95	822	0.72	-52.3	1.31
			9:10 AM		20.9	5.99	808	0.33	-64.0	0.61
			9:15 AM		20.8	6.01	781	0.29	-68.4	0.51
ML7-3	28-Mar-07	3.00	10:50 AM	0.090	--	--	--	--	--	--
			11:17 AM		23.0	5.90	1625	0.75	-33.5	18.40
			11:20 AM		23.2	5.90	1557	0.55	-35.9	9.80
			11:25 AM		23.6	5.90	1504	0.62	-36.0	7.57
ML7-5	28-Mar-07	3.00	1:44 PM	0.190	--	--	--	--	--	--
			1:55 PM		25.0	5.53	596	0.64	21.4	6.71
			2:00 PM		20.8	5.51	619	0.09	28.9	1.63
			2:05 PM		20.8	5.54	618	0.03	-36.9	0.9
ML7-7	29-Mar-07	3.00	8:54 AM	0.100	--	--	--	--	--	--
			9:00 AM		19.9	6.23	1095	0.43	-71.0	1.99
			9:05 AM		20.1	6.25	1001	0.34	-99.1	2.12
			9:10 AM		20.3	6.27	971	0.20	-117.6	0.96

Notes:

ft btoc - feet below top of casing
Lpm - liters per minute
°C - degrees Celsius
µS/cm - microsiemens per centimeter
mg/L - milligrams per litre
mV - millivolts
NTU - nephelometric turbidity units
-- - not recorded/measured

TABLE E-17: JULY 2007 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (meter)	ORP (mV)	Turbidity (NTU)
PMW-1	11-Jul-07	3.01	3:06 PM	0.320	--	--	--	--	--	--
			3:10 PM		27.1	5.77	721	0.68	-9.0	12.70
			3:35 PM		26.8	5.66	797	0.36	-107.5	49.70
			3:52 PM		26.6	5.74	710	0.46	-104.9	7.77
			4:13 PM		26.4	5.76	674	0.45	-105.5	8.60
PMW-2	11-Jul-07	2.98	4:25 PM	0.350	26.3	5.80	649	0.45	-106.0	5.37
			9:15 AM		--	--	--	--	--	--
			9:16 AM		25.1	6.04	690	1.44	-180.2	2.37
			9:40 AM		24.0	5.97	602	0.77	-225.5	2.08
			10:02 AM		24.0	5.99	574	0.49	-218.2	3.03
PMW-3	11-Jul-07	3.06	10:25 AM	0.350	24.0	5.99	571	0.35	-223.8	1.24
			10:46 AM		23.8	6.01	558	0.21	-225.0	1.36
			11:52 AM		--	--	--	--	--	--
			11:56 AM		24.8	5.80	597	0.92	-155.9	4.10
			12:46 PM		25.0	5.64	502	0.94	-192.5	2.98
PMW-4	11-Jul-07	2.99	1:13 PM	0.400	23.9	5.64	508	0.40	-194.2	3.05
			1:30 PM		24.0	5.64	507	0.28	-192.0	3.10
			2:54 PM		23.8	5.64	517	0.21	-189.3	1.09
			11:15 AM		--	--	--	--	--	--
			11:18 AM		23.7	5.65	112.1	0.59	-114.5	3.21
PMW-5	12-Jul-07	3.35	11:43 AM	0.400	23.9	5.61	207.0	0.20	-117.3	1.49
			12:01 PM		23.8	5.61	130.7	0.26	-125.9	1.74
			12:17 PM		23.8	5.59	101.0	0.58	-130.9	1.08
			12:39 PM		23.8	5.59	493.0	0.30	-135.8	1.39
			9:50 AM		--	--	--	--	--	--
PMW-6	12-Jul-07	3.58	9:53 AM	0.380	23.5	4.92	1011	1.41	-174.2	1.34
			10:14 AM		23.4	4.94	658	0.38	-210.7	1.27
			10:33 AM		23.3	4.98	611	0.33	-214.7	1.32
			10:54 AM		23.3	5.00	586	0.29	-214.5	1.41
			11:08 AM		23.4	5.00	589	0.26	-214.7	0.89
ML1-2	12-Jul-07	--	8:15 AM	0.380	--	--	--	--	--	--
			8:18 AM		23.4	5.38	854	1.17	-118.4	1.34
			8:36 AM		23.4	5.36	483	1.07	-237.0	1.14
			9:00 AM		23.6	5.38	444	0.91	-249.7	2.08
			9:18 AM		23.4	5.46	426	0.82	-252.6	1.44
ML1-4	12-Jul-07	--	2:08 PM	--	--	--	--	--	--	--
			2:21 PM		34.6	6.21	825	0.79	-99.0	195.00
			2:27 PM		33.7	6.23	726	0.66	-108.0	128.00
			4:10 PM		33.6	6.23	676	0.57	-109.1	77.3
			4:16 PM		--	--	--	--	--	--
ML1-5	12-Jul-07	--	4:23 PM	--	26.3	5.98	601	0.34	-92.8	1.40
			4:30 PM		25.3	5.99	571	0.32	-100.1	0.72
			4:52 PM		24.9	5.99	556	0.23	-107.6	1.53
			4:55 PM		--	--	--	--	--	--
			5:00 PM		25.8	6.29	216	0.77	-109.9	4.86
ML1-6	12-Jul-07	--	5:05 PM	--	24.8	6.29	190.4	0.05	-111.6	2.18
			5:30 PM		24.8	6.27	758	0.00	-115.8	1.97
			5:34 PM		--	--	--	--	--	--
			5:43 PM		25.2	6.10	677	0.58	-37.4	2.60
			5:50 PM		24.0	6.08	530	0.05	-96.1	2.34
ML1-7	13-Jul-07	--	5:50 PM	0.120	24.6	6.08	524	0.10	-90.5	3.9
			8:29 AM		--	--	--	--	--	--
			8:45 AM		25.8	6.19	933	1.98	-186.8	1.92
			9:00 AM		24.0	6.17	868	0.98	-201.5	1.60
			9:05 AM		24.0	6.17	852	1.03	-206.0	1.61
ML2-2	12-Jul-07	--	1:08 PM	--	--	--	--	--	--	--
			2:34 PM		35.0	5.22	1074	1.29	33.7	38.70
			2:41 PM		34.5	5.20	1026	1.23	-40.9	38.60
			2:46 PM		34.5	5.20	702	1.13	-39.9	38.20
			9:35 AM		--	--	--	--	--	--
ML2-4	13-Jul-07	--	9:39 AM	0.120	25.2	5.86	1696	1.26	-167.7	7.60
			9:44 AM		24.8	5.86	1566	1.38	-172.7	0.47
			9:50 AM		24.6	5.80	1461	1.42	-174.4	0.32
			10:42 AM		--	--	--	--	--	--
			10:45 AM		25.3	5.95	581	1.09	-115.4	11.80
ML2-5	13-Jul-07	--	10:51 AM	0.120	24.3	--	530	0.60	-96.0	2.13
			10:56 AM		24.3	5.91	508	0.61	-106.3	1.91
			12:39 PM		--	--	--	--	--	--
			12:48 PM		27.2	6.20	567	0.71	-66.6	2.70
			12:53 PM		24.4	6.12	388	0.44	-73.5	1.04
ML2-6	13-Jul-07	--	1:03 PM	0.120	24.0	6.06	573	0.53	-79.2	0.45
			1:32 PM		--	--	--	--	--	--
			1:37 PM		24.1	6.21	532	0.60	-80.8	4.20
			1:47 PM		23.8	6.23	331	0.31	-107.5	7.83
			1:56 PM		24.3	6.33	628	0.38	-127.0	3.49
ML3-2	13-Jul-07	--	3:54 PM	0.120	--	--	--	--	--	--
			5:26 PM		33.9	6.15	18.9	0.15	-183.3	142.00
			5:33 PM		33.6	6.11	18.2	0.12	-177.0	165.00
			5:40 PM		33.5	6.09	1811*	0.18	-177.2	145.00

TABLE E-17: JULY 2007 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (meter)	ORP (mV)	Turbidity (NTU)
ML3-4	14-Jul-07	--	8:21 AM	0.120	--	--	--	--	--	--
			8:25 AM		24.5	5.46	1998	0.31	-123.4	16.40
			8:30 AM		24.0	5.54	1533	0.21	-146.5	14.50
			8:33 AM		23.9	5.65	1432	0.24	-158.4	10.50
ML3-5	14-Jul-07	--	8:58 AM	0.120	--	--	--	--	--	--
			9:02 AM		25.4	5.86	775	0.83	-99.6	35.00
			9:07 AM		25.4	5.88	129.2	0.25	-109.1	29.40
			9:12 AM		25.3	5.90	1708*	0.57	-110.8	15.70
ML3-6	14-Jul-07	--	9:35 AM	0.050	--	--	--	--	--	--
			9:38 AM		25.4	5.54	332	1.03	-46.6	16.10
			9:46 AM		25.9	5.72	300	0.62	-84.1	11.80
			9:55 AM		26.3	5.78	1292*	0.38	-100.0	10.70
ML3-7	14-Jul-07	--	10:51 AM	0.050	--	--	--	--	--	--
			10:55 AM		24.4	6.14	243	0.13	-105.9	11.10
			11:00 AM		24.0	6.18	301	0.19	-116.6	11.90
			11:05 AM		23.9	6.20	1045*	0.20	-114.3	11.00
ML4-2	14-Jul-07	--	11:46 AM	0.050	--	--	--	--	--	--
			1:16 PM		30.5	5.97	1559	0.31	-85.5	404.00
			1:20 PM		30.6	5.97	1534	0.21	-85.5	345.00
			1:24 PM		30.6	5.97	1532	0.20	-86.5	257.00
ML4-4	16-Jul-07	--	8:18 AM	0.120	--	--	--	--	--	--
			8:21 AM		25.0	6.11	846	1.77	-135.5	24.90
			8:26 AM		24.9	6.09	723	1.10	-154.9	3.60
			8:30 AM		24.8	6.01	710	1.16	-169.2	3.97
ML4-5	16-Jul-07	--	8:55 AM	0.050	--	--	--	--	--	--
			8:58 AM		25.7	6.01	548	2.04	-97.3	3.30
			9:02 AM		25.1	5.97	536	0.95	-102.5	1.18
			9:06 AM		24.7	5.95	520	0.89	-103.8	0.41
ML4-6	16-Jul-07	--	9:55 AM	0.120	--	--	--	--	--	--
			9:58 AM		24.6	5.94	490	1.54	-99.5	0.77
			10:03 AM		24.1	5.92	496	0.76	-103.3	0.38
			10:10 AM		23.6	5.90	494	0.71	-111.0	0.45
ML4-7	16-Jul-07	--	10:35 AM	0.120	--	--	--	--	--	--
			10:40 AM		24.7	6.16	698	4.29	-107.1	4.27
			10:48 AM		23.5	6.12	668	0.76	-119.7	1.88
			10:55 AM		23.3	6.08	654	0.58	-122.8	0.91
ML5-2	16-Jul-07	--	1:39 PM	0.025	--	--	--	--	--	--
			1:12 PM		32.3	5.82	947	2.08	-54.6	195.00
			1:17 PM		32.3	5.82	941	2.04	-54.4	134.00
			1:21 PM		32.4	5.82	932	1.99	-59.7	102.00
ML5-4	16-Jul-07	--	2:23 PM	0.120	--	--	--	--	--	--
			2:27 PM		26.6	5.45	190.7	1.11	-20.6	23.30
			2:32 PM		25.9	5.43	208	0.77	-25.6	0.84
			2:37 PM		25.9	5.43	553	0.77	-34.2	0.72
ML5-5	16-Jul-07	--	3:12 PM	0.120	--	--	--	--	--	--
			3:16 PM		25.5	5.71	646	0.99	-70.3	14.20
			3:20 PM		25.6	5.69	597	0.74	-74.1	0.75
			3:30 PM		25.8	5.65	586	0.74	-75.0	0.66
ML5-6	16-Jul-07	--	3:43 PM	0.120	--	--	--	--	--	--
			3:48 PM		25.1	6.00	736	1.21	-71.4	3.65
			3:52 PM		25.0	6.02	730	0.68	-76.9	0.84
			3:58 PM		25.0	5.98	691	0.60	-78.0	0.55
ML5-7	16-Jul-07	--	4:12 PM	0.120	--	--	--	--	--	--
			4:16 PM		24.8	6.14	879	0.81	-88.5	1.50
			4:21 PM		24.7	6.14	856	0.64	-95.3	0.56
			4:26 PM		24.2	6.12	825	0.61	-100	0.73
ML6-2	17-Jul-07	--	8:13 AM	0.040	--	--	--	--	--	--
			9:02 AM		29.3	6.06	1380	1.69	-88.4	30.30
			9:06 AM		29.2	6.04	1368	0.87	-84.2	33.00
			9:09 AM		29.2	6.04	1382	0.71	-87.1	28.80
ML6-4	17-Jul-07	--	10:16 AM	0.120	--	--	--	--	--	--
			10:20 AM		25.3	5.97	783	0.73	-88.5	12.80
			10:24 AM		24.7	5.89	766	0.13	-99.3	1.03
			10:28 AM		24.5	5.81	720	0.06	-102.4	0.48
ML6-5	17-Jul-07	--	10:48 AM	0.120	--	--	--	--	--	--
			10:52 AM		24.8	5.63	869	0.40	-79.5	3.89
			10:57 AM		24.3	5.45	848	0.07	-89.0	0.61
			11:02 AM		24.3	5.29	815	0.03	-84.7	2.45
ML6-6	17-Jul-07	--	12:34 PM	0.120	--	--	--	--	--	--
			12:39 PM		25.4	5.72	669	0.31	-77.9	3.46
			12:46 PM		24.2	5.74	659	0.02	-92.3	0.73
			12:55 PM		23.9	5.73	654	0.00	-102.6	0.52
ML6-7	17-Jul-07	--	1:12 PM	0.120	--	--	--	--	--	--
			1:18 PM		25.3	6.09	714	0.32	-84.3	1.38
			1:23 PM		24.7	6.09	708	0.03	-93.3	0.65
			1:30 PM		24.2	6.05	681	0.00	-98.6	0.69
ML7-2	12-Jul-07	--	1:52 PM	0.040	--	--	--	--	--	--
			2:54 PM		32.9	5.43	272	0.29	-27.2	86.40
			3:00 PM		33.0	5.43	241	0.25	-25.5	77.20
			3:05 PM		33.0	5.43	2590*	0.25	-26.4	69.80
ML7-4	18-Jul-07	--	8:26 AM	0.120	--	--	--	--	--	--
			8:30 AM		25.1	5.80	1289	0.62	-76.0	6.16
			8:34 AM		24.8	5.78	1158	0.61	-80.6	0.84
			8:38 AM		24.5	5.76	1060	0.57	-83.6	0.87

TABLE E-17: JULY 2007 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (meter)	ORP (mV)	Turbidity (NTU)
ML7-5	18-Jul-07	--	8:58 AM	0.120	--	--	--	--	--	--
			9:01 AM		24.7	5.04	957	0.61	-0.9	4.06
			9:06 AM		24.3	5.00	944	0.12	-11.4	0.57
			9:11 AM		24.2	5.00	919	0.08	-22.7	0.44
ML7-6	18-Jul-07	--	9:34 AM	0.120	--	--	--	--	--	--
			--		24.7	5.67	1042	0.38	-71.0	4.62
			--		24.1	5.67	1042	0.15	-80.3	0.61
			--		23.9	5.77	1059	0.12	-85.7	0.44
ML7-7	18-Jul-07	--	10:32 AM	0.120	--	--	--	--	--	--
			10:37 AM		24.8	6.23	1051	0.39	-82.2	3.54
			10:45 AM		24.1	6.25	1116	0.14	-110.6	0.94
			10:53 AM		24.1	6.25	1153	0.12	-120.1	0.37

Notes:

ft btoc - feet below top of casing

Lpm - liters per minute

°C - degrees Celsius

µS/cm - microsiemens per centimeter

mg/L - milligrams per litre

mV - millivolts

NTU - nephelometric turbidity units

-- - not recorded/measured

* - value after cleaning probe

TABLE E-18: JANUARY 2008 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (mg/L)	ORP (mV)	Turbidity (NTU)
PMW-1	16-Jan-08	2.84	9:04 AM	0.320	18.8	6.12	718	1.53	0.5	30.4
			9:20 AM		19.5	6.11	573	0.79	-183.4	37.50
			9:49 AM		19.7	6.20	492	1.15	-178.5	19.30
			10:13 AM		20.0	6.22	456	1.52	-169.9	6.94
PMW-2	16-Jan-08	2.80	10:58 AM	0.320	19.7	6.32	385	1.49	-210.1	6.48
			11:20 AM		20.4	6.21	357	0.32	-289.4	1.96
			11:40 AM		20.4	6.17	348	0.35	-299.1	1.60
			12:02 PM		20.6	6.17	330	0.39	-269.1	1.28
			12:24 PM		20.4	6.15	332	0.38	-267.2	0.89
PMW-3	16-Jan-08	18.80	2:12 PM	0.370	19.7	5.81	858	1.18	-178.9	3.36
			2:32 PM		20.2	5.63	636	0.42	-243.2	2.10
			2:54 PM		20.4	5.59	580	0.35	-249.0	1.11
			3:15 PM		20.3	5.56	553	0.36	-249.4	0.90
			3:38 PM		20.4	5.54	533	0.37	-249.5	0.95
PMW-4	17-Jan-08	18.80	9:33 AM	0.350	18.0	5.59	575	1.57	11.9	13.8
			9:54 AM		19.8	5.59	475	0.66	-65.3	5.67
			10:13 AM		19.9	5.61	455	0.71	-105.2	4.01
			10:36 AM		20.1	5.61	446	0.83	-122.8	2.78
			10:52 AM		20.1	5.61	438	0.85	-125.4	1.81
PMW-5	17-Jan-08	18.99	11:35 AM	0.410	18.8	5.18	1808	0.71	-105	5.43
			11:56 AM		20.1	5.26	1570	0.44	-152.9	4.25
			12:15 PM		20.3	5.26	1623	0.42	-152.1	2.02
			12:33 PM		20.5	5.24	1541	0.46	-146.4	1.46
			12:49 PM		20.5	5.24	1418	0.44	-140.1	1.19
PMW-6	17-Jan-08	18.80	2:51 PM	0.370	18.8	6.30	762	0.59	-180.7	12
			3:11 PM		20.2	6.26	508	0.34	-193.0	7.48
			3:34 PM		20.5	6.16	386	0.38	-238.3	4.75
			3:56 PM		20.5	6.10	338	0.36	-249.1	3.29
			4:17 PM		20.5	6.08	303	0.36	-242.4	2.49
ML 1-2	17-Jan-08	--	4:57 PM	--	16.2	6.32	97.4	0.39	-177	>1000
			5:00 PM		16.7	6.32	72.3	0.27	-201.8	>1000
			5:05 PM		16.5	6.32	59.8	0.15	-207.2	772
ML 1-3	18-Jan-08	--	8:32 AM	--	16.7	6.37	745	0.68	-107.8	45.2
			8:37 AM		17.2	6.37	349	0.60	-157.10	32.7
			8:42 AM		17.9	6.37	284	0.58	-160.20	10.3
			--		--	--	796*	--	--	--
ML 1-4	18-Jan-08	--	9:25 AM	--	17.9	6.27	407	0.80	-126	4.56
			9:30 AM		18.6	6.25	352	0.52	-132.6	1.80
			9:35 AM		19.2	6.19	319	0.50	-126.3	1.21
			--		--	--	634*	--	--	--
ML 1-5	18-Jan-08	--	10:12 AM	--	19.6	6.43	492	0.89	-134.9	5.73
			10:17 AM		20.3	6.39	466	0.39	-152.4	2.02
			10:22 AM		20.8	6.35	435	0.39	-153.1	1.45
			--		--	--	681*	--	--	--
ML 1-7	18-Jan-08	--	10:57 AM	--	20.3	6.37	679	0.61	-131.7	5.14
			11:02 AM		20.9	6.35	652	0.42	-140.1	2.03
			11:10 AM		21.3	6.33	624	0.32	-141.4	1.54
			--		--	--				
ML 2-3	18-Jan-08	--	1:58 PM	--	19.6	5.85	945	0.77	-77.2	27.8
			2:05 PM		19.5	5.78	228	0.70	-78.0	31.90
			2:10 PM		19.5	5.80	123.1	0.81	-80.2	28.10
			--		--	--	740*	--	--	--
ML 2-4	20-Jan-08	--	8:14 AM	--	16.2	5.80	722	1.98	-17.4	3.49
			8:19 AM		16.6	5.90	648	1.09	-80.1	1.71
			8:24 AM		17.2	5.92	617	1.27	-123.8	0.76
ML 2-5	20-Jan-08	--	8:58 AM	--	17.2	6.00	242	1.12	-150.9	12.4
			9:03 AM		16.9	6.00	233	0.91	-165.0	6.12
			9:08 AM		17.3	6.00	226	0.73	-172.6	2.82
			--		--	--	332*	--	--	--
ML 2-6	20-Jan-08	--	9:59 AM	--	18.6	6.21	252	1.61	-185.4	2.94
			10:04 AM		19.2	6.13	206	1.08	-172.5	1.19
			10:11 AM		19.9	6.07	198.3	0.89	-148.1	0.70
			--		--	--	441*	--	--	--
ML 2-7	20-Jan-08	--	10:50 AM	--	20.1	6.21	192.8	0.93	-162.7	5.65
			10:55 AM		20.9	6.19	187.9	0.48	-185.2	4.61
			11:00 AM		21.3	6.27	181.2	0.32	-197.9	2.08
			--		--	--	1003*	--	--	--
ML 3-2	20-Jan-08	--	11:55 AM	no recovery	NA	NA	NA	NA	NA	NA
ML 3-3	20-Jan-08	--	3:07 PM	0.030	11.8	6.37	1.9	0.00	12.5	199
			3:15 PM		12.8	6.37	2	0.00	-39.0	45.40
			3:20 PM		12.4	6.36	987*	0.00	-41.0	33.10
ML 3-4	21-Jan-08	--	8:57 AM	0.045	4.2	5.58	622	1.55	17.6	10.4
			9:01 AM		4.1	5.59	458	0.85	14.6	8.29
			9:09 AM		4.2	5.59	408	0.52	4.9	4.23

TABLE E-18: JANUARY 2008 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (mg/L)	ORP (mV)	Turbidity (NTU)
ML 3-5	21-Jan-08	--	11:38 AM	0.030	11.5	6.27	592	1.91	-10.3	18.3
			11:44 AM		11.7	6.25	577	1.92	-36.4	19.40
			11:48 AM		11.5	6.23	578	1.95	-27.2	20.80
			--		--	--	--	--	--	--
ML 3-7	21-Jan-08	--	3:36 PM	0.050	15.2	6.33	303	0.52	-140.3	23.9
			3:42 PM		14.5	6.30	302	0.98	-136.1	15.90
			3:50 PM		13.8	6.34	304	0.61	-136.7	12.80
			4:27 PM		13.1	6.45	284	0.17	-138.1	6.28
ML 4 -2	21-Jan-08	--	--	--	--	--	539*	--	--	--
			4:47 PM		11.9	6.14	1202	0.00	-87.3	14.9
			4:52 PM		11.7	6.14	1214	0.03	-97.6	12.50
			4:59 PM		11.5	6.17	1189	0.03	-94.0	12.10
ML 4-3	22-Jan-08	--	8:10 AM	0.120	16.0	6.09	704	0.8	-115	5.8
			8:15 AM		16.8	6.09	608	0.71	-125.1	2.18
			8:20 AM		17.2	6.09	584	0.67	-122.9	0.87
ML 4-5	22-Jan-08	--	9:00 AM	--	17.4	6.10	345	0.61	-83.8	7.24
			9:05 AM		17.3	6.10	339	0.49	-86.6	2.28
			9:10 AM		17.6	6.08	333	0.52	-88.7	1.67
			--		--	--	430*	--	--	--
ML 4-6	22-Jan-08	--	9:48 AM	--	18.0	6.10	405	0.94	-91.0	1.75
			9:55 AM		18.7	6.08	401	0.42	-95.6	0.99
			10:02 AM		19.3	6.06	363	0.35	-98.6	0.76
ML 4-7	22-Jan-08	--	10:34 AM	--	19.3	6.18	510	1.29	-75.2	4.20
			10:41 AM		19.4	6.14	473	0.35	-84.6	4.77
			10:48 AM		20.1	6.16	423	0.25	-91.0	5.20
			--		--	--	--	--	--	--
ML 5-2	22-Jan-08	--	12:40 PM	--	15.9	6.00	1106	1.33	-61.3	18.2
			12:45 PM		16.0	6.00	1103	1.02	-56.2	18.2
			12:54 PM		16.3	6.00	1116	0.90	-53.5	14.0
			--		--	--	--	--	--	--
ML 5-3	22-Jan-08	--	2:23 PM	--	18.8	6.38	745	0.41	-93.6	5.91
			2:28 PM		19.2	6.36	722	0.14	-99.0	2.97
			2:33 PM		19.4	6.34	710	0.11	-102.1	1.71
ML 5-5	22-Jan-08	--	4:15 PM	--	19.7	5.72	545	0.49	-42.9	1.65
			4:22 PM		20.1	5.68	472	0.16	-67.8	1.22
			4:29 PM		20.3	5.82	424	0.12	-103.0	0.78
			--		--	--	--	--	--	--
ML 5-6	23-Jan-08	--	8:17 AM	--	18.4	5.84	630	1.41	-33.4	36.7
			8:24 AM		18.8	5.90	638	1.11	-51.9	12.90
			8:31 AM		19.4	5.84	606	0.98	-57.2	4.30
ML 5-7	23-Jan-08	--	9:00 AM	--	19.6	6.32	589	1.43	-51.6	3.68
			9:07 AM		19.9	6.26	573	0.83	-65.4	2.22
			9:14 AM		20.2	6.28	574	0.78	-77.0	2.26
ML 6-3	23-Jan-08	--	10:02 AM	--	17.1	6.42	840	0.99	-95.6	75.6
			10:05 AM		17.4	6.42	854	0.78	-100.0	89.10
			10:08 AM		17.6	6.42	852	0.74	-105.0	48.10
ML 6-4	23-Jan-08	--	10:49 AM	--	19.1	6.02	463	0.84	-136.6	42.4
			10:53 AM		19.4	6.04	457	0.46	-160.40	19.90
			10:57 AM		19.6	6.02	453	0.38	-167.20	14.10
ML 6-5	23-Jan-08	--	12:57 PM	--	20.8	5.63	981	0.97	-110.6	1.53
			1:03 PM		21.4	5.37	939	0.69	-123.8	5.15
			1:09 PM		21.6	5.23	898	0.49	-130.1	4.01
ML 6-6	23-Jan-08	--	1:56 PM	--	21.0	5.85	662	0.60	-148.2	4.36
			2:03 PM		21.7	5.85	615	0.10	-160.9	0.99
			2:10 PM		21.8	5.83	609	0.16	-164.9	0.38
ML 6-7	23-Jan-08	--	2:37 PM	--	21.9	6.26	584	1.13	-185.7	1.48
			2:44 PM		22.1	6.26	585	0.23	-217.4	0.84
			2:51 PM		22.2	6.28	583	0.15	-226.2	0.44
ML 7-3	23-Jan-08	--	3:35 PM	--	19.8	5.54	1782	0.95	-85.2	28.4
			3:38 PM		20.2	5.60	1847	0.33	-125.8	22.80
			3:41 PM		20.2	5.68	1870	0.18	-141.9	10.90
ML 7-4	23-Jan-08	--	4:33 PM	--	18.6	5.98	--	0.61	-56.7	1.35
			4:38 PM		17.7	5.90	--	0.20	-70.6	0.16
			4:43 PM		17.4	5.88	--	0.12	-77.3	0.32
ML 7-5	24-Jan-08	--	8:19 AM	--	18.0	5.13	773	0.90	-47.2	0.72
			8:26 AM		18.3	5.17	516	0.27	-63.8	0.50
			8:33 AM		18.7	5.17	367	0.24	-83.5	0.41
			--		--	--	936*	--	--	--
ML 7-6	24-Jan-08	--	9:11 AM	--	19.2	5.75	555	0.57	-103.6	1.86
			9:18 AM		19.7	5.75	466	0.33	-126.3	0.62
			9:25 AM		19.4	5.83	433	0.26	-137.6	0.99
ML 7-7	24-Jan-08	--	10:21 AM	--	18.9	6.29	553	0.64	-154	0.99
			10:28 AM		20.0	6.31	524	0.15	-171.3	1.53
			10:35 AM		20.5	6.29	507	0.14	-177.2	1.49
			--		--	--	1180	--	--	--

Notes:

ft btoc - feet below top of casing
Lpm - liters per minute
°C - degrees Celsius
µS/cm - microsiemens per centimeter
mg/L - milligrams per litre
mV - millivolts
NTU - nephelometric turbidity units
-- - not recorded/measured
NA - not applicable
* - value after cleaning probe

TABLE E-19: JULY 2008 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (mg/L)	ORP (mV)	Turbidity (NTU)
PMW-1	16-Jul-08	3.33	12:43 PM	0.390	27.3	5.91	517	0.75	-176.0	18.1
			12:57 PM		26.9	6.05	671	0.60	-154.3	23.8
			1:19 PM	0.220	26.8	6.03	646	0.43	-147.2	5.42
			1:47 PM		26.9	5.99	676	0.43	-136.4	4.07
			2:13 PM		26.7	6.01	685	0.48	-125.4	2.79
			--		--	--	827*	--	--	--
PMW-2	16-Jul-08	3.38	10:24 AM	0.400	24.9	5.81	521	1.03	-158.2	2.92
			10:43 AM		24.3	5.83	417	0.10	-166.4	1.28
			10:58 AM		24.1	5.85	405	0.11	-168.2	1.03
			11:15 AM		24.0	5.85	399	0.11	-159.0	0.76
			11:34 AM		24.4	5.85	386	0.09	-181.0	0.71
			--		--	--	474*	--	--	--
PMW-3	16-Jul-08	18.80	8:22 AM	0.375	23.7	5.57	507	1.07	-225.8	2.83
			8:41 AM		24.0	5.66	499	0.55	-240.8	1.62
			9:01 AM		23.9	5.68	476	0.42	-261.8	1.41
			9:21 AM		24.0	5.69	422	0.31	-242.6	1.33
			9:41 AM		24.1	5.69	388	0.26	-229.4	1.70
			--		--	--	480*	--	--	--
PMW-4	16-Jul-08	18.80	6:08 PM	0.390	24.3	5.81	101.8	0.73	-128.1	4.55
			6:23 PM		24.4	5.77	76.4	0.00	-150.1	3.77
			6:42 PM		24.1	5.77	68.1	0.04	-156.1	2.75
			7:00 PM		23.9	5.77	64.8	0.08	-161.4	1.98
			7:18 PM		23.9	5.75	62.0	0.10	-163.3	1.83
			--		--	--	435*	--	--	--
PMW-5	16-Jul-08	18.80	4:27 PM	0.400	23.7	5.43	1620	0.32	-206.8	3.25
			4:46 PM		23.8	5.41	1383	0.04	-234.4	2.76
			5:04 PM		23.7	5.39	1271	0.12	-235.4	1.95
			5:22 PM		23.6	5.37	1141	0.13	-237.5	3.14
			5:40 PM		23.6	5.37	1110	0.13	-238.3	1.75
			--		--	--	1116*	--	--	--
PMW-6	16-Jul-08	18.80	2:44 PM	0.400	25.7	5.98	446	0.90	-141.2	11.2
			3:04 PM		23.8	5.96	405	0.00	-235.5	5.79
			3:21 PM		23.6	5.94	423	0.00	-244.1	3.56
			3:41 PM		23.5	5.90	426	0.10	-257.2	3.03
			4:01 PM		23.5	5.91	440	0.18	-258.8	2.37
			--		--	--	538*	--	--	--
ML1-2	17-Jul-08	--	8:28 AM	0.025	26.2	6.37	1610	0.72	-113.0	54.4
			8:35 AM		26.2	6.37	1522	0.46	-122.0	25.0
			8:40 AM		26.7	6.39	1620	0.56	-124.7	28.6
ML1-3	22-Jul-08	--	8:25 AM	0.026	27.4	6.20	705	1.14	-233.9	3.81
			8:30 AM		27.5	6.22	700	1.12	-247.50	2.29
			8:35 AM		27.7	6.24	700	1.03	-260.90	1.81
			--		--	--	901*	--	--	--
ML1-4	17-Jul-08	--	9:27 AM	0.170	25.0	5.96	153.8	1.42	-47.4	2.91
			9:32 AM		24.9	5.94	156.3	0.38	-34.5	2.04
			9:37 AM		24.7	5.94	159.0	0.19	35.4	1.26
			--		--	--	559*	--	--	--
ML 1-5	22-Jul-08	--	9:17 AM	0.120	25.5	6.46	748	0.61	-275.1	11.9
			9:22 AM		24.8	6.42	710	0.38	-284.2	6.30
			9:27 AM		24.6	6.38	684	0.27	-296.6	4.05
			--		--	--	772*	--	--	--
ML1-6	17-Jul-08	--	10:24 AM	0.170	25.1	6.11	204.0	0.23	-1.7	2.6
			10:30 AM		24.1	6.11	198.6	0.11	-21.9	2.84
			10:36 AM		23.8	6.13	196.1	0.09	-29.9	5.56
			--		--	--	825*	--	--	--
ML1-7	22-Jul-08	--	9:58 AM	0.130	25.5	6.32	963	0.95	-292.1	4.51
			10:03 AM		24.7	6.30	937	0.43	-307.6	2.50
			10:08 AM		24.8	6.32	917	0.31	-317.8	1.80
			--		--	--	1055*	--	--	--
ML 2-2	22-Jul-08	--	11:40 AM	0.030	30.0	5.37	798	1.43	-254.6	16.2
			11:45 AM		30.0	5.37	791	1.5	-238.1	14.3
			11:50 AM		30.1	5.37	810	1.36	-238.3	12.6
			--		--	--	2980*	--	--	--
ML 2-3	17-Jul-08	--	11:54 AM	0.080	28.4	5.56	45.3	0.97	-63.4	8.42
			12:06 PM	0.040	28.6	5.58	35.6	0.84	-66.4	8.16
			12:11 PM	0.040	28.7	5.60	33.3	0.80	-64.3	8.84
			--		--	--	3620*	--	--	--
ML 2-4	21-Jul-08	--	5:10 PM	0.170	25.7	5.88	1361	0.50	-332.6	8.11
			5:15 PM		25.5	5.90	1174	0.16	-378.3	3.32
			5:20 PM		25.4	5.86	1094	0.14	-384.1	1.44
ML2-5	17-Jul-08	--	3:46 PM	0.150	24.6	6.06	175.3	0.38	79.5	6.72
			3:55 PM		23.7	6.00	134.1	0.14	-47.9	8.24
			4:00 PM		23.6	6.00	123.1	0.14	-83.3	7.98
			--		--	--	516*	--	--	--
ML 2-6	17-Jul-08	--	4:35 PM	0.180	24.0	6.23	38.7	0.99	125.2	1.92
			4:40 PM		23.6	6.19	36.2	0.53	112.3	0.73
			4:46 PM		23.3	6.15	34.4	0.31	62.4	0.53
			--		--	--	515*	--	--	--

TABLE E-19: JULY 2008 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (mg/L)	ORP (mV)	Turbidity (NTU)
ML2-7	17-Jul-08	--	5:28 PM	0.180	23.7	6.18	14.2	0.83	117.8	1.97
			5:33 PM		23.0	6.20	12.5	0.31	112.4	21.6
			5:38 PM		22.9	6.30	11.4	0.28	102.1	34.8
			--		--	--	--	--	--	--
ML 3-2	17-Jul-08	--	3:05 PM	0.010	29.3	6.24	3540	1.02	-21.4	183
ML3-3	22-Jul-08	--	3:26 PM	0.006	34.3	6.16	1259	0.20	-235.5	542
			3:31 PM		34.3	6.16	1286	0.20	-242.9	523
			3:36 PM		34.3	6.16	1334	0.20	-248.9	367
			--		--	--	5490*	--	--	--
ML 3-4	18-Jul-08	--	8:15 AM	0.150	24.8	5.61	255.0	0.73	-50.1	11.6
			8:20 AM		24.4	5.74	190.9	0.64	-103.7	2.25
			8:25 AM		24.3	5.78	167.2	0.61	-131.1	1.64
			--		--	--	934*	--	--	--
ML 3-5	21-Jul-08	--	2:02 PM	0.130	26.9	6.31	1409	0.73	-325.7	43.3
			2:29 PM		30.5	6.36	1376	0.82	-304.9	23.1
			2:39 PM		31.5	6.34	1411	0.76	-320.9	28.2
			--		--	--	1689*	--	--	--
ML 3-6	18-Jul-08	--	9:00 AM	0.150	24.6	5.86	6.0	1.70	-80.2	21.7
			9:28 AM		25.8	6.03	5.3	1.01	-106.5	27.0
			10:02 AM		27.1	6.18	5.3*	1.02	-104.5	27.0
			--		--	--	--	--	--	--
ML 3-7	21-Jul-08	--	4:30 PM	0.140	26.0	6.06	966	0.77	-313.2	11.0
			4:35 PM		24.8	6.08	993	0.27	-346.0	8.45
			4:40 PM		24.7	6.10	983	0.21	-376.3	8.11
			--		--	--	997*	--	--	--
ML 4 -2	23-Jul-08	--	11:17 AM	0.006	32.6	5.98	1323	1.15	-89.3	199
			11:22 AM		32.3	5.98	1304	1.14	-92.2	155
			11:27 AM		32.0	5.98	1287	1.15	-86.1	152
			--		--	--	3240*	--	--	--
ML 4-3	21-Jul-08	--	8:36 AM	0.020	28.0	6.06	855	0.97	-129.8	11.1
			8:41 AM		28.0	6.06	863	0.97	-137.3	7.55
			8:51 AM		28.2	6.10	884	0.83	-160.1	6.39
			9:01 AM		28.5	6.12	912	0.74	-178.6	6.25
ML 4-4	21-Jul-08	--	--	0.160	--	--	1083*	--	--	--
			9:59 AM		26.0	6.14	494	0.62	-312.7	8.76
			10:04 AM		25.8	6.06	445	0.39	-364.2	4.85
			10:09 AM		25.5	6.02	431	0.33	-378.3	6.18
ML 4-5	21-Jul-08	--	--	0.150	--	--	572*	--	--	--
			10:50 AM		25.7	6.13	586	0.62	-333.9	5.48
			10:55 AM		25.1	6.11	567	0.26	-368.9	3.36
			11:00 AM		24.9	6.09	560*	0.24	-393.2	2.06
ML 4-6	21-Jul-08	--	12:25 PM	0.160	25.1	6.15	572	0.60	-312.4	1.97
			12:30 PM		24.6	6.13	561	0.36	-355.0	1.83
			12:35 PM		24.3	6.13	557	0.28	-367.7	1.48
			--		--	--	687*	--	--	--
ML 4-7	21-Jul-08	--	1:04 PM	0.140	25.2	6.22	863	0.80	-332.0	6.36
			1:10 PM		24.4	6.22	804	0.36	-374.8	8.31
			1:15 PM		24.4	6.22	762	0.26	-387.3	7.57
			--		--	--	938*	--	--	--
ML5-2	22-Jul-08	--	5:31 PM	0.008	36.2	6.40	1313	1.02	-88.2	118
			5:36 PM		36.4	6.40	1317	0.96	-90.5	84.7
			5:41 PM		36.5	6.40	1322	0.88	-82.6	89.1
			--		--	--	2570*	--	--	--
ML5-3	18-Jul-08	--	12:51 PM	0.025	27.5	6.17	81.4	0.56	-105.7	54.7
			1:00 PM		27.5	6.17	81.6	0.39	-128.50	10.6
			1:06 PM		27.6	6.17	80.1	0.38	--	6.26
			--		--	--	129*	--	--	--
ML5-4	18-Jul-08	--	1:55 PM	0.140	25.4	5.8	269	0.77	-207.3	35.9
			2:00 PM		25.1	5.8	258	0.26	-240.1	18.8
			2:05 PM		24.9	5.8	253	0.25	-271.7	7.86
			--		--	--	404*	--	--	--
ML5-5	18-Jul-08	--	2:46 PM	0.140	25.1	5.94	431	0.63	-248.6	62.1
			2:51 PM		24.5	5.88	406	0.24	-254.9	30.4
			2:56 PM		24.4	5.84	377	0.16	-252.1	10.5
			--		--	--	514*	--	--	--
ML 5-6	18-Jul-06	--	3:42 PM	0.130	25.2	6.14	676	0.84	-200.7	13.9
			3:47 PM		24.7	6.10	640	0.27	-215.4	9.77
			3:52 PM		24.6	6.08	612	0.21	-226.1	7.04
			--		--	--	801*	--	--	--
ML5-7	18-Jul-08	--	4:21 PM	0.140	25.0	6.18	721	0.98	-193.7	1.9
			4:27 PM		24.4	6.20	702	0.22	-223.1	10.9
			4:32 PM		24.1	6.20	686	0.13	-234.6	14.2
			--		--	--	963*	--	--	--
ML 6-2	23-Jul-08	--	9:13 AM	0.006	28.2	6.14	1725	3.56	-79.4	132
			9:18 AM		28.0	6.14	1741	3.28	-80.2	102
			9:23 AM		27.9	6.16	1788	3.06	-81.6	90.7
			--		--	--	2560*	--	--	--
ML6-3	19-Jul-08	--	9:05 AM	0.095	27.8	5.84	951	1.13	-181.0	8.57
			9:12 AM		28.1	5.84	930	0.90	-181.8	3.32
			9:19 AM		28.4	5.83	911	0.88	-181.6	2.63
			--		--	--	1389*	--	--	--

TABLE E-19: JULY 2008 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (mg/L)	ORP (mV)	Turbidity (NTU)
ML6-4	19-Jul-08	--	10:15 AM	0.170	25.9	5.25	547	0.82	-189.7	7.29
			10:20 AM		25.4	4.77	534	0.35	-211.6	4.86
			10:25 AM		25.3	3.84	536	0.27	-223.3	2.28
			10:50 AM		25.6	5.50	528	0.33	-245.9	0.94
			10:55 AM		24.8	5.52	545	0.22	-251.3	0.92
			--		--	--	578*	--	--	--
ML 6-5	19-Jul-08	--	11:22 AM	0.150	24.7	5.38	1131	0.58	-201.4	6.17
			11:27 AM		24.5	5.33	1040	0.23	-217.5	2.90
			11:33 AM		24.1	5.23	971	0.09	-223.9	2.06
			--		--	--	1069*	--	--	--
ML 6-6	19-Jul-08	--	1:08 PM	0.160	24.8	5.76	910	1.19	-123.2	2.81
			1:13 PM		24.3	5.72	886	0.69	-154.8	0.51
			1:18 PM		24.1	5.68	868	0.60	-171.8	0.56
			1:21 PM		24.5	5.68	1147*	0.38	-183.4	0.60
ML 6-7	19-Jul-08	--	1:51 PM	0.150	23.9	6.01	1026	0.43	-160.2	1.55
			1:56 PM		23.8	6.03	971	0.25	-188.0	0.35
			2:01 PM		23.6	6.05	940	0.21	-197.7	0.39
			--		--	--	1222*	--	--	--
ML 7-2	23-Jul-08	--	9:50 AM	0.006	28.0	5.5	4060	1.14	-79.9	445
			9:55 AM		28.1	5.5	4030	0.87	-75.7	371
			10:00 AM		28.1	5.52	4020	0.79	-77.2	198
			--		--	--	4050*	--	--	--
ML 7-3	23-Jul-08	--	1:03 PM	0.006	30.7	5.68	2160	2.4	10.4	35.9
			1:08 PM		30.5	5.72	2150	2.0	-24.9	23.7
			1:13 PM		30.3	5.72	2160	1.52	-41.7	13.7
			--		--	--	2310*	--	--	--
ML7-4	19-Jul-08	--	2:58 PM	0.190	25.4	5.52	834	0.31	-186.3	2.4
			3:03 PM		24.9	5.52	821	0.26	-193.1	0.33
			3:08 PM		24.6	5.58	852	0.23	-199.3	0.47
			--		--	--	1086*	--	--	--
ML 7-5	19-Jul-08	--	3:36 PM	0.130	24.6	5.22	1555	0.38	-164.3	1.24
			3:41 PM		24.6	5.22	1521	0.25	-173.2	0.92
			3:46 PM		24.3	5.20	1490	0.14	-183.5	1.03
			--		--	--	1657*	--	--	--
ML 7-6	19-Jul-08	--	4:16 PM	0.170	24.4	5.93	1433	0.44	-163.4	3.49
			4:21 PM		23.9	5.91	1339	0.13	-180.5	1.22
			4:26 PM		23.7	5.87	1289	0.06	-193.0	1.03
			4:30 PM		24.1	5.85	1818*	0.05	-196.2	1.45
ML 7-7	19-Jul-08	--	5:05 PM	0.150	24.6	6.25	1074	0.49	-170.9	10.9
			5:10 PM		24.2	6.25	1094	0.17	-194.1	4.45
			5:15 PM		23.9	6.27	1112	0.12	-200.5	2.92
			--		--	--	1512*	--	--	--

Notes:

ft btoc - feet below top of casing
Lpm - liters per minute
°C - degrees Celsius
µS/cm - microsiemens per centimeter
mg/L - milligrams per litre
mV - millivolts
NTU - nephelometric turbidity units
-- - not recorded/measured
* - value after cleaning probe

TABLE E-20: MARCH 2009 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (mg/L)	ORP (mV)	Turbidity (NTU)
PMW-1	4-Mar-09	2.82	2:43 PM	--	--	--	--	--	--	--
			2:46 PM	0.380	17.8	6.13	852	2.15	-61.7	32.5
			3:00 PM	--	17.6	6.19	1015	1.61	-84.4	24.20
			3:21 PM	0.210	17.8	6.27	930	1.08	-106.0	6.70
			3:47 PM	0.150	17.6	6.25	839	0.83	-116.6	4.30
PMW-2	4-Mar-09	2.65	4:30 PM	--	16.9	6.25	867	0.42	-128.4	2.60
			1:48 AM	--	--	--	--	--	--	--
			12:51 PM	0.380	19.4	6.37	510	0.44	-93.6	3.40
			1:10 PM	--	18.9	6.36	448	0.27	-119.9	1.44
			1:29 PM	--	19.0	6.30	384	0.54	-138.8	0.80
PMW-3	4-Mar-09	2.71	1:50 PM	--	19.0	6.28	380	0.31	-149.4	0.60
			9:19 AM	--	--	--	--	--	--	--
			9:22 AM	0.360	15.8	5.75	466	1.57	-246.6	5.47
			9:51 AM	--	17.7	5.79	370	0.76	-245.4	2.79
			10:12 AM	--	17.9	5.80	352	0.63	-242.5	1.67
PMW-4	5-Mar-09	--	10:37 AM	--	18.0	5.82	343	0.58	-233.9	1.27
			11:01 AM	--	18.5	5.82	330	0.52	-243.4	1.47
			10:31 AM	--	--	--	--	--	--	--
			10:33 AM	0.400	18.7	5.82	721.0	1.09	-91.8	4.28
			10:54 AM	--	18.6	5.82	617.0	0.26	-103.1	1.46
PMW-5	5-Mar-09	--	11:08 AM	--	18.6	5.84	576.0	0.27	-96.6	1.09
			11:25 AM	--	18.7	5.84	552.0	0.27	-101.5	0.71
			11:40 AM	--	18.6	5.86	532	0.31	-95.8	0.55
			8:33 AM	--	--	--	--	--	--	--
			8:36 AM	0.410	17.8	5.37	1261	1.18	-71.0	2.16
PMW-6	4-Mar-09	2.92	8:55 AM	--	18.3	5.47	992	0.59	-118.6	1.37
			9:16 AM	--	18.7	5.47	924	0.59	-144.7	0.76
			9:32 AM	--	18.7	5.47	846	0.55	-156.1	0.61
			9:53 AM	--	18.8	5.47	861	0.51	-166.6	0.46
			5:02 PM	--	--	--	--	--	--	--
ML1-2	7-Mar-09	--	5:06 PM	0.400	18.1	6.27	656	1.08	-95.5	11.20
			5:31 PM	--	18.4	6.20	454	0.17	-118.7	5.30
			5:44 PM	--	18.2	6.16	415	0.21	-127.9	4.90
			6:08 PM	--	18.4	6.14	425	0.22	-154.6	3.5
			6:27 PM	--	18.5	6.12	433	0.24	-173.0	3.4
ML1-3	7-Mar-09	--	1:12 PM	--	--	--	--	--	--	--
			1:45 PM	0.040	25.7	6.45	999	0.77	-111.8	103.0
			1:50 PM	--	25.1	6.45	996	0.69	-113.0	68.5
ML1-4	9-Mar-09	--	1:55 PM	--	24.8	6.45	995	0.64	-114.4	53.8
			3:04 PM	--	--	--	--	--	--	--
			3:33 PM	--	24.9	6.46	800	1.00	-86.00	4.36
ML1-5	9-Mar-09	--	3:44 PM	--	24.3	6.44	791	0.8	-97.80	3.38
			8:38 AM	--	--	--	--	--	--	--
			8:43 AM	0.140	17.9	6.00	485.0	0.42	-152.9	3.84
ML1-6	9-Mar-09	--	8:49 AM	--	18.0	6.08	483.0	0.56	-170.9	1.85
			8:54 AM	--	18.2	6.12	483	0.54	-178.8	1.44
			9:27 AM	--	--	--	--	--	--	--
ML1-7	9-Mar-09	--	9:31 AM	0.140	19.0	6.41	569	0.14	-123.9	14.10
			9:36 AM	--	19.2	6.43	550	0.33	-157.9	5.78
			9:41 AM	--	19.3	6.45	528	0.33	-178.9	3.14
ML2-2	5-Mar-09	--	10:30 AM	--	--	--	--	--	--	--
			10:37 AM	0.120	20.1	6.30	668.0	0.36	-147.4	8.79
			10:43 AM	--	19.8	6.30	670.0	0.40	-153.2	6.24
ML2-3	5-Mar-09	--	10:49 AM	--	20.3	6.30	668.0	0.44	-162.6	5.22
			11:31 AM	--	--	--	--	--	--	--
			11:35 AM	0.130	22.0	6.41	837	0.26	-109.4	1.92
ML2-4	6-Mar-09	--	11:41 AM	--	22.1	6.39	828	0.42	-138.9	1.57
			11:46 AM	--	22.2	6.37	815	0.39	-151.7	1.65
			1:46 PM	--	--	--	--	--	--	--
ML2-5	6-Mar-09	--	2:23 PM	0.006	22.9	5.61	3130	1.14	-72.7	-0.5
			2:30 PM	--	22.4	5.61	3170	1.31	-77.7	9.6
			2:37 PM	--	22.2	5.61	3210	1.2	-77.7	8.75
ML2-6	6-Mar-09	--	4:17 PM	--	--	--	--	--	--	--
			4:34 PM	--	17.2	5.92	1166.0	1.46	-46.0	1.95
			4:40 PM	--	17.0	5.96	1160.0	1.06	-52.4	0.82
ML2-7	6-Mar-09	--	4:49 PM	--	16.7	5.96	1158.0	0.76	-57.8	0.67
			8:43 AM	--	--	--	--	--	--	--
			8:50 AM	0.120	17.4	5.81	900	1.08	-2.8	5.02
ML2-8	6-Mar-09	--	9:00 AM	--	17.6	5.84	894	0.88	-14.5	0.87
			9:05 AM	--	17.7	5.82	877	0.81	-19.5	0.51
			9:08 AM	--	17.8	5.82	856	0.73	-22.3	0.42
ML2-9	6-Mar-09	--	9:30 AM	--	--	--	--	--	--	--
			9:35 AM	0.120	18.6	5.88	376.0	0.68	-74.5	4.97
			9:40 AM	--	18.9	6.00	372.0	0.51	-55.7	2.53
ML2-10	6-Mar-09	--	9:45 AM	--	19.1	6.04	351.0	0.4	-45.0	0.74
			10:50 AM	--	--	--	--	--	--	--
			10:55 AM	0.130	20.2	6.20	527.0	0.37	68.2	4.35
ML2-11	6-Mar-09	--	11:00 AM	--	20.5	6.18	492.0	0.40	-74.5	2.44
			11:30 AM	--	--	--	--	--	--	--
			11:35 AM	0.180	21.5	6.26	1008.0	0.49	-85.7	7.04
ML2-12	6-Mar-09	--	11:40 AM	--	21.8	6.26	928.0	0.31	-62.6	20.50
			11:46 AM	--	21.8	6.34	907	0.27	-60.6	23.60

TABLE E-20: MARCH 2009 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (mg/L)	ORP (mV)	Turbidity (NTU)
ML 3-2	12-Mar-09	--	1:58 PM	--	--	--	--	--	--	--
			3:35 PM	0.010	23.9	6.85	3520	1.8	-130.2	562.00
			4:00 PM	0.008	22.3	6.85	3520	1.29	-128.2	622.00
ML3-3	13-Mar-09	--	4:30 PM	--	--	--	--	--	--	--
			5:57 PM	0.030	17.0	6.21	2160	1.16	-63.5	13.20
			6:02 PM	--	16.9	6.21	2600	1.07	-62.8	12.40
ML 3-4	14-Mar-09	--	6:07 PM	--	16.7	6.21	2570	1.16	-63.0	9.97
			8:53 AM	--	--	--	--	--	--	--
			8:57 AM	0.120	15.9	5.50	664.0	0.76	2.4	9.97
ML 3-5	14-Mar-09	--	9:02 AM	--	16.1	5.56	670.0	0.80	-3.1	5.87
			9:07 AM	--	16.40	5.60	673	0.8	-52.7	3.54
			9:35 AM	--	--	--	--	--	--	--
ML 3-6	14-Mar-09	--	9:40 AM	0.080	15.8	6.37	1083	0.87	-103.6	19.60
			9:50 AM	--	14.4	6.43	1034	1.15	97.4	16.30
			9:55 AM	--	13.5	6.43	999	1.27	93.9	15.50
ML 3-7	14-Mar-09	--	11:17 AM	--	--	--	--	--	--	--
			12:05 PM	0.080	15.0	6.27	835	1.00	-71.2	21.80
			12:20 PM	0.070	15.5	6.27	856	1.38	-75.2	23.50
ML 4 -2	11-Mar-09	--	12:35 PM	--	16.0	6.29	876	1.02	-70.0	20.80
			1:54 PM	--	--	--	--	--	--	--
			2:30 PM	0.045	16.1	6.11	684	1.61	-38.3	10.20
ML 4-3	11-Mar-09	--	3:00 PM	--	15.7	6.15	686	1.46	-39.7	4.53
			3:30 PM	--	16.4	6.15	677	1.18	-39.7	4.08
			3:30 PM	--	--	--	--	--	--	--
ML 4-4	12-Mar-09	--	1:47 PM	0.060	25.3	6.53	2150	0.62	-137.1	230
			2:25 PM	--	24.8	6.53	2170	0.58	-139.4	126
			2:33 PM	--	24.5	6.51	2170	0.58	-139.6	91.80
ML 4-5	12-Mar-09	--	2:39 PM	--	--	--	--	--	--	--
			3:52 PM	0.080	22.0	6.33	1162	0.67	-100.3	35.20
			4:29 PM	--	21.8	6.33	1146	0.46	-101.9	9.57
ML 4-6	12-Mar-09	--	4:36 PM	--	21.7	6.33	1131	0.40	-102.2	9.08
			4:42 PM	--	--	--	--	--	--	--
			8:48 AM	0.120	18.1	6.12	503	0.60	-133.8	7.58
ML 4-7	12-Mar-09	--	8:55 AM	--	18.6	6.14	486	0.50	-136.3	7.25
			9:00 AM	--	18.8	6.14	471	0.49	-140.60	4.93
			9:05 AM	--	--	--	--	--	--	--
ML 4-8	12-Mar-09	--	9:36 AM	0.110	19.1	6.18	543	0.32	-102.1	6.46
			9:42 AM	--	19.3	6.18	542	0.41	-99.6	4.31
			9:47 AM	--	19.1	6.16	534	0.43	-98.5	1.21
ML 4-9	12-Mar-09	--	9:52 AM	--	--	--	--	--	--	--
			10:31 AM	0.130	19.6	6.19	518	0.43	-83.5	1.22
			10:36 AM	--	19.9	6.17	527	0.43	-88.1	0.86
ML 4-10	12-Mar-09	--	10:41 AM	--	19.9	6.17	531	0.37	-86.7	1.13
			10:46 AM	--	--	--	--	--	--	--
			11:20 AM	0.120	20.1	6.29	709	0.75	-66.9	8.94
ML 5-1	6-Mar-09	--	11:25 AM	--	20.2	6.25	701	0.58	-71.4	10.50
			11:30 AM	--	20.2	6.25	692	0.47	-75.4	6.17
			11:35 AM	--	--	--	--	--	--	--
ML 5-2	6-Mar-09	--	1:29 PM	0.040	27.8	5.77	1328	0.73	-13.4	41.90
			2:17 PM	--	27.7	5.77	1320	0.68	-14.7	39.40
			2:22 PM	--	27.4	5.8	1339	0.62	-19.6	33.10
ML 5-3	6-Mar-09	--	2:27 PM	--	--	--	--	--	--	--
			4:01 PM	0.056	20.8	5.92	1451.0	0.60	-26.80	5.74
			4:20 PM	--	20.6	5.93	1451.0	0.34	-74.8	5.11
ML 5-4	7-Mar-09	--	4:25 PM	--	20.3	5.93	1438	0.22	-102.1	4.81
			4:30 PM	--	--	--	--	--	--	--
			8:36 AM	0.110	17.6	5.6	322	0.13	-141.8	32.0
ML 5-5	7-Mar-09	--	3:20 PM	--	17.6	5.7	324	0.45	-195.5	5.77
			8:47 AM	--	17.8	5.69	332	0.43	-207.0	3.47
			8:54 AM	--	--	--	--	--	--	--
ML 5-6	7-Mar-09	--	9:24 AM	0.130	18.7	5.83	449	0.11	-175.4	63.70
			9:28 AM	--	18.9	5.83	449	0.34	-185.6	9.59
			9:33 AM	--	19.0	5.83	460	0.34	-188.5	4.90
ML 5-7	7-Mar-09	--	9:38 AM	--	--	--	--	--	--	--
			10:39 AM	0.120	20.8	6.02	497	0.17	-142.8	17.30
			10:42 AM	--	20.8	6.00	495	0.33	-161.5	3.13
ML 5-8	7-Mar-09	--	10:47 AM	--	20.9	6	494	0.29	-176.1	2.7
			10:55 AM	--	--	--	--	--	--	--
			11:25 AM	0.110	21.7	6.30	809	0.35	-110.6	8.0
ML 6-1	10-Mar-09	--	11:30 AM	--	21.5	6.30	781	0.35	-121.3	8.3
			11:35 AM	--	21.7	6.24	755	0.29	-141.4	5.01
			11:44 AM	--	--	--	--	--	--	--
ML 6-2	10-Mar-09	--	2:07 PM	0.060	22.8	6.22	2320	0.73	-85.5	41
			2:42 PM	--	22.6	6.22	2330	0.71	-85.9	33.1
			2:47 PM	--	22.3	6.24	2340	0.60	-85.6	22.3
ML 6-3	10-Mar-09	--	2:52 PM	--	--	--	--	--	--	--
			4:05 PM	0.080	20.4	6.30	1667	0.68	-88.0	33.90
			4:37 PM	--	20.1	6.31	1634	0.63	-96.3	4.85
ML 6-4	11-Mar-09	--	4:49 PM	--	19.9	6.31	1612	0.48	-101.7	4.42
			4:57 PM	--	--	--	--	--	--	--
			8:45 AM	0.140	17.3	5.84	388	0.77	-143.9	75.80
ML 6-5	11-Mar-09	--	8:50 AM	0.110	17.7	5.90	422	0.65	-173.7	30.80
			8:56 AM	--	17.8	5.92	426	0.60	-189.1	17.60
			9:02 AM	--	--	--	--	--	--	--

TABLE E-20: MARCH 2009 FIELD PARAMETER DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Depth to Water (ft btoc)	Time	Pumping Rate (Lpm)	Temperature (°C)	pH (pH units)	Specific Conductance (uS/cm)	D.O. (mg/L)	ORP (mV)	Turbidity (NTU)
ML 6-5	11-Mar-09	--	9:35 AM	--	--	--	--	--	--	--
			9:40 AM	0.110	18.3	5.49	893	0.57	-150.1	4.19
			9:45 AM		18.6	5.37	992	0.57	-155.4	2.03
			9:50 AM		18.8	5.37	1007	0.55	-160.1	1.41
ML 6-6	11-Mar-09	--	10:40 AM	--	--	--	--	--	--	--
			10:45 AM	0.110	19.4	5.71	811	0.50	-145.6	2.07
			10:50 AM		19.8	5.71	816	0.42	-159.7	1.28
			10:56 AM		19.8	5.71	808	0.41	-169.5	0.47
ML 6-7	11-Mar-09	--	11:45 AM	--	--	--	--	--	--	--
			11:50 AM	0.120	20.4	6.17	984	0.20	-137.6	1.20
			11:55 AM		20.8	6.15	1007	0.09	-163.9	0.55
			12:00 PM		21.0	6.15	996	0.06	-174.2	1.07
ML 7-2	9-Mar-09	--	1:47 PM	--	--	--	--	--	--	--
			2:47 PM	0.060/0.050	33.8	5.8	3430	0.63	-66.0	397
			2:54 PM		33.7	5.86	3430	0.41	-41.6	297
			3:00 PM		33.4	5.86	3410	0.42	-76.4	260.00
ML 7-3	9-Mar-09	--	4:28 PM	--	--	--	--	--	--	--
			4:44 PM	0.170	20.9	5.82	2810	0.4	63.0	3.93
			4:50 PM		20.4	5.84	2850	0.30	53.9	1.49
			4:56 PM		20.3	5.86	2840	0.15	35.8	0.96
ML 7-4	10-Mar-09	--	8:35 AM	--	--	--	--	--	--	--
			8:40 AM	0.110	18.2	5.46	950	0.90	-125.9	10.70
			8:45 AM		18.3	5.50	950	0.66	-161.2	0.90
			8:50 AM		18.4	5.5	958	0.59	-174.4	1.01
ML 7-5	10-Mar-09	--	9:28 AM	--	--	--	--	--	--	--
			9:32 AM	0.120	18.7	5.27	1236	0.56	-136.4	2.45
			9:37 AM		18.8	5.29	1263	0.40	-153.4	1.22
			9:42 AM		18.9	5.29	1262	0.30	-162.2	0.89
ML 7-6	10-Mar-09	--	10:30 AM	--	--	--	--	--	--	--
			10:35 AM	0.115	19.4	5.91	1422	0.91	-132.4	3.52
			10:40 AM		20.0	5.91	1401	0.43	-167.1	1.49
			10:45 AM		19.8	5.91	1397	0.30	-183.7	1.03
ML 7-7	10-Mar-09	--	11:30 AM	--	--	--	--	--	--	--
			11:35 AM	0.080	21.0	6.45	1183	0.82	-123.1	49.90
			11:40 AM		20.9	6.45	1199	0.61	-135.0	31.00
			11:45 AM		21.4	6.43	1261	0.55	-156.0	21.8

Notes:

ft btoc - feet below top of casing
Lpm - liters per minute
°C - degrees Celsius
µS/cm - microsiemens per centimeter
mg/L - milligrams per litre
mV - millivolts
NTU - nephelometric turbidity units
-- - not recorded/measured
* - value after cleaning probe

TABLE E-21: JUNE 2006 FIELD ANALYTICAL DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Chemets D.O. (mg/L)	Chemets Fe ²⁺ (mg/L)	Hach Fe ²⁺ (mg/L)	Alkalinity (CaCO ₃) (mg/L)	Hach S ²⁻ (mg/L)
PMW-1	26-Jun-06	0.1	> 10	21.0	153.0	under range
PMW-2	26-Jun-06	0.0	5.0	5.2	122.0	23.0
PMW-3	26-Jun-06	0.0	>10	16.1	115.0	19.0
PMW-4	26-Jun-06	0.1	8.0	8.6	76.0	11.0
PMW-5	26-Jun-06	2.0	4.0	5.1	98.0	96.0
PMW-6	26-Jun-06	0.1	>10	14.0	106.0	27.0

Notes:

mg/L - milligrams per litre

TABLE E-22: AUGUST 2006 FIELD ANALYTICAL DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Alkalinity (CaCO ₃) (mg/L)
PMW-3	21-Aug-06	104
PMW-5	21-Aug-06	105
PMW-6	21-Aug-06	102
ML1-4	21-Aug-06	360
ML1-6	21-Aug-06	144
ML2-2	22-Aug-06	164
ML2-3	22-Aug-06	260
ML2-4	21-Aug-06	303
ML2-5	22-Aug-06	225
ML2-6	21-Aug-06	129
ML3-2	22-Aug-06	268
ML3-3	22-Aug-06	368
ML3-4	22-Aug-06	213
ML3-5	22-Aug-06	132
ML3-6	22-Aug-06	241
ML4-2	22-Aug-06	360
ML4-2	24-Aug-06	377
ML4-4	24-Aug-06	332
ML4-6	24-Aug-06	256
ML5-2	23-Aug-06	285
ML5-3	23-Aug-06	300
ML5-4	23-Aug-06	312
ML5-5	23-Aug-06	419
ML5-6	23-Aug-06	262
ML5-7	23-Aug-06	351
ML6-2	24-Aug-06	253
ML6-4	24-Aug-06	402
ML6-6	24-Aug-06	161
ML7-2	23-Aug-06	340
ML7-3	23-Aug-06	463
ML7-4	23-Aug-06	370
ML7-5	23-Aug-06	370
ML7-6	24-Aug-06	522
ML7-7	24-Aug-06	403

Notes:

mg/L - milligrams per litre

TABLE E-23: OCTOBER 2006 FIELD ANALYTICAL DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Alkalinity (CaCO ₃) (mg/L)
PMW-3	10-Oct-06	149
PMW-5	4-Oct-06	136
ML1-2	3-Oct-06	277
ML1-3	3-Oct-06	445
ML1-5	3-Oct-06	539
ML1-7	3-Oct-06	360
ML2-3	4-Oct-06	333
ML2-5	4-Oct-06	203
ML2-7	4-Oct-06	479
ML3-5	3-Oct-06	121
ML3-7	4-Oct-06	198
ML4-3	4-Oct-06	225
ML4-5	4-Oct-06	287
ML4-7	3-Oct-06	430
ML5-3	4-Oct-06	276
ML5-5	4-Oct-06	308
ML6-3	4-Oct-06	281
ML6-5	4-Oct-06	221
ML6-7	4-Oct-06	329
ML7-3	4-Oct-06	495

Notes:

mg/L - milligrams per litre

TABLE E-24: NOVEMBER 2006 FIELD ANALYTICAL DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Hach Fe ²⁺ (mg/L)	Alkalinity (CaCO ₃) (mg/L)	Hach S ²⁻ (mg/L)
PMW-1	30-Nov-06	48.0	211	390.0
PMW-2	30-Nov-06	9.9	160	31.0
PMW-3	29-Nov-06	8.9	102	165.0
ML1-3	30-Nov-06	17.5	432	76.0
ML1-5	30-Nov-06	62.0	438	205.0
ML1-7	30-Nov-06	4.8	243	243.0
ML2-5	1-Dec-06	6.3	176	140.0
ML3-3	4-Dec-06	144.0	454	40.0
ML3-5	4-Dec-06	69.0	152	1070.0
ML4-3	29-Nov-06	28.8	245	251.0
ML4-5	29-Nov-06	5.2	179	200.0
ML4-7	30-Nov-06	3.9	241	1705.0
ML5-3	29-Nov-06	54.3	304	147.0
ML5-5	29-Nov-06	6.2	148	1970.0
ML5-7	29-Nov-06	4.9	201	--
ML6-3	29-Nov-06	21.3	290	232.0
ML6-5	29-Nov-06	7.4	147	1410.0
ML6-7	29-Nov-06	5.0	249	1030.0
ML7-3	2-Dec-06	5.0	487	191.0
ML7-5	4-Dec-06	9.1	173	695.0
ML7-7	4-Dec-06	3.3	415	1615.0

Notes:

mg/L - milligrams per litre

TABLE E-25: JANUARY 2007 FIELD ANALYTICAL DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Hach Fe ²⁺ (mg/L)	Alkalinity (CaCO ₃) (mg/L)	Hach S ²⁻ (mg/L)
PMW-1	19-Jan-07	83.0	174	680.0
PMW3	19-Jan-07	13.3	87	227.0
PMW-5	19-Jan-07	over range	41	1290.0
PMW-6	19-Jan-07	17.8	143	2170.0
ML1-2	20-Jan-07	59.0	254	80.0
ML1-4	20-Jan-07	7.5	310	129.0
ML1-6	20-Jan-07	0.2	159	--
ML2-2	20-Jan-07	0.3	101	134.0
ML2-3	20-Jan-07	332.5	302	31.0
ML2-4	21-Jan-07	13.5	265	291.0
ML2-5	21-Jan-07	2.9	149	98.0
ML2-6	21-Jan-07	1.1	158	37.0
ML3-2	21-Jan-07	325.0	682	80.0
ML3-3	21-Jan-07	238.0	464	11.0
ML3-4	21-Jan-07	58.0	149	1560.0
ML3-6	21-Jan-07	243.0	251	340.0
ML3-7	22-Jan-07	135.0	194	215.0
ML4-2	22-Jan-07	119.0	340	58.0
ML4-4	23-Jan-07	17.8	214	288.0
ML4-6	23-Jan-07	5.6	175	58.0
ML5-2	23-Jan-07	104.0	289	0.036
ML5-4	23-Jan-07	9.3	64	2860.0
ML5-4	23-Jan-07	7.3	56	2640.0
ML5-6	23-Jan-07	29.5	141	69.0
ML6-2	23-Jan-07	99.0	325	28.0
ML6-4	24-Jan-07	8.2	215	920.0
ML6-6	24-Jan-07	24.5	154	690.0
ML7-2	24-Jan-07	330.0	255	86.0
ML7-3	24-Jan-07	63.0	381	125.0
ML7-4	24-Jan-07	32.0	219	954.0
ML7-5	25-Jan-07	15.3	71	1725.0
ML7-6	25-Jan-07	20.5	326	550.0
ML7-7	25-Jan-07	12.6	303	720.0
ML7-7	25-Jan-07	12.6	296	1055.0

Notes:

mg/L - milligrams per litre

-- - not measured

TABLE E-26: MARCH 2007 FIELD ANALYTICAL DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Hach Fe ²⁺ (mg/L)	Alkalinity (CaCO ₃) (mg/L)	Hach S ²⁻ (µg/L)
PMW-1	26-Mar-07	66	164	279
PMW-2	26-Mar-07	13.9	145	269
PMW-3	21-Mar-07	18.8	58	2040
PMW-5	21-Mar-07	68.5	31	2240
PMW-6	21-Mar-07	16	117	1820
ML1-3	24-Mar-07	25.1	343	38
ML1-5	24-Mar-07	6.2	382	91
ML1-7	24-Mar-07	4.55	226	176
ML2-3	22-Mar-07	174	266	65
ML2-5	22-Mar-07	2.59	131	53
ML2-7	22-Mar-07	2.7	299	67
ML3-3	26-Mar-07	395	355	70
ML3-5	27-Mar-07	1.28	181	39
ML3-7	27-Mar-07	1.13	349	153
ML4-3	23-Mar-07	49.5	209	190
ML4-5	23-Mar-07	7.9	160	335
ML4-7	23-Mar-07	7.4	190	1270
ML5-3	23-Mar-07	76	292	161
ML5-5	23-Mar-07	13.5	95	1020
ML5-7	23-Mar-07	20.25	176	1370
ML6-3	27-Mar-07	30	356	67
ML6-5	27-Mar-07	14.7	79	1030
ML6-5	27-Mar-07	17	78	1130
ML6-7	28-Mar-07	19.5	171	373
ML7-3	28-Mar-07	152	757	160
ML7-5	28-Mar-07	14.3	68	555
ML7-7	29-Mar-07	12.75	238	534

Notes:

mg/L - milligrams per litre

µg/L - micrograms per litre

TABLE E-27: JULY 2007 FIELD ANALYTICAL DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Duplicate	Hach Fe ²⁺ (mg/L)	Alkalinity (CaCO ₃) (mg/L)	Hach S ²⁻ (µg/L)
PMW-1	11-Jul-07	--	114	180	166
PMW-2	11-Jul-07	--	875	133	1000
PMW-2	11-Jul-07	Duplicate	740	--	--
PMW-3	11-Jul-07	--	9.6	69	96
PMW-3	11-Jul-07	Duplicate	8.1	75	92
PMW-4	12-Jul-07	--	109	73	13
PMW-5	12-Jul-07	--	92	19	2550
PMW-6	12-Jul-07	--	13	80	1820
ML1-2	12-Jul-07	--	49	320	40
ML1-4	12-Jul-07	--	9.6	194	62
ML1-5	12-Jul-07	--	6.7	303	137
ML1-6	12-Jul-07	--	4.35	210	14
ML1-7	13-Jul-07	--	3.85	254	102
ML2-2	12-Jul-07	--	240	59	227.5
ML2-4	13-Jul-07	--	23	199	267
ML2-5	13-Jul-07	--	2.35	128	46
ML2-6	13-Jul-07	--	405	172	22
ML2-7	13-Jul-07	--	2.65	237	128
ML3-2	13-Jul-07	--	425	189	75
ML3-4	14-Jul-07	--	139	232	269
ML3-5	14-Jul-07	--	181	357	27
ML3-6	14-Jul-07	--	164	238	38
ML3-7	14-Jul-07	--	40	268	99
ML4-2	14-Jul-07	--	227.5	331	43
ML4-4	16-Jul-07	--	177	163	801
ML4-5	16-Jul-07	--	9.8	151	169
ML4-5	16-Jul-07	Duplicate	9.7	151	197
ML4-6	16-Jul-07	--	12.2	171	176
ML4-7	16-Jul-07	--	10.6	263	444
ML5-2	16-Jul-07	--	160	240	66
ML5-4	16-Jul-07	--	78	69	1370
ML5-5	16-Jul-07	--	13	86	740
ML5-6	16-Jul-07	--	15.4	173	460
ML5-7	16-Jul-07	--	11.4	258	783
ML6-2	17-Jul-07	--	108	237	116
ML6-4	17-Jul-07	--	11.75	139	1570
ML6-5	17-Jul-07	--	18.5	57	1760
ML6-6	17-Jul-07	--	20.6	100	920
ML6-7	17-Jul-07	--	10	199	300
ML7-2	12-Jul-07	--	295	329	102.5
ML7-4	18-Jul-07	--	28	148	447
ML7-5	18-Jul-07	--	27.8	21	1250
ML7-6	18-Jul-07	--	23	175	370
ML7-7	18-Jul-07	--	16.1	258	587

Notes:

mg/L - milligrams per litre

µg/L - micrograms per litre

-- - not measured

TABLE E-28: JANUARY 2008 FIELD ANALYTICAL DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Duplicate	Hach Fe ²⁺ (mg/L)	Alkalinity (CaCO ₃) (mg/L)	Hach S ²⁻ (µg/L)
PMW-1	16-Jan-08	--	17	217	154
PMW-2	16-Jan-08	--	12.9	175	72
PMW-3	16-Jan-08	--	24.8	70	1340
PMW-3	16-Jan-08	Duplicate	25	68	1200
PMW-4	17-Jan-08	--	31.7	85	10
PMW-4	17-Jan-08	Duplicate	33.5	--	--
PMW-5	17-Jan-08	--	123.5	66	1650
PMW-6	17-Jan-08	--	21.5	147	1390
PMW-6	17-Jan-08	Duplicate	24.5	149	1280
ML1-2	17-Jan-08	--	69	253	240
ML1-3	18-Jan-08	--	39	327	70
ML1-4	18-Jan-08	--	11	210	38
ML1-5	18-Jan-08	--	7.5	239	91
ML1-7	18-Jan-08	--	5.7	282	59
ML2-3	18-Jan-08	--	183	205	60
ML2-4	20-Jan-08	--	24.6	150	395
ML2-5	20-Jan-08	--	2.5	124	70
ML2-6	20-Jan-08	--	4.05	168	33
ML2-7	20-Jan-08	--	2.7	251	80
ML3-2	20-Jan-08	--	--	--	--
ML3-3	20-Jan-08	--	600	446	40
ML3-4	21-Jan-08	--	185	147	30
ML3-5	21-Jan-08	--	178	413	30
ML3-7	21-Jan-08	--	33	174	262
ML4-2	21-Jan-08	--	282	310	17
ML4-3	22-Jan-08	--	68	208	270
ML4-5	22-Jan-08	--	9.3	167	224
ML4-6	22-Jan-08	--	9.7	182	481
ML4-7	22-Jan-08	--	10.5	279	400
ML5-2	22-Jan-08	--	144	230	147.5
ML 5-3	22-Jan-08	--	88	249	108
ML5-5	22-Jan-08	--	20.4	105	780
ML5-6	23-Jan-08	--	22.2	110	516
ML5-7	23-Jan-08	--	--	260	476
ML6-3	23-Jan-08	--	64	335	330
ML6-4	23-Jan-08	--	10.3	102	2370
ML6-4	23-Jan-08	Duplicate	10.7	94	2420
ML6-5	23-Jan-08	--	29.9	30	1440
ML6-6	23-Jan-08	--	28.7	81	940
ML6-7	23-Jan-08	--	12.7	214	400
ML7-3	23-Jan-08	--	212	275	--
ML7-4	23-Jan-08	--	36.5	113	628
ML7-5	23-Jan-08	--	55.25	42	748
ML7-6	24-Jan-08	--	27.6	182	295
ML7-7	24-Jan-08	--	18.2	198	575

Notes:

mg/L - milligrams per litre

µg/L - micrograms per litre

-- - not measured

TABLE E-29: JULY 2008 FIELD ANALYTICAL DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Duplicate	Hach Fe ²⁺ (mg/L)	Alkalinity (CaCO ₃) (mg/L)	Hach S ²⁻ (µg/L)
PMW-1	16-Jul-08	--	66	222	213
PMW-2	16-Jul-08	--	4.95	109	124
PMW-3	16-Jul-08	--	8	91	729
PMW-3	16-Jul-08	Duplicate	8	95	720
PMW-4	16-Jul-08	--	13.2	79	10
PMW-5	16-Jul-08	--	89	45	5270
PMW-6	16-Jul-08	--	9.8	123	3340
ML1-2	17-Jul-08	--	20	327	82.5
ML1-3	22-Jul-08	--	10	270	92
ML1-4	17-Jul-08	--	10.6	140	32
ML1-5	22-Jul-08	--	6.3	238	36
ML1-6	17-Jul-08	--	7	172	17
ML1-7	22-Jul-08	--	4.4	236	36
ML2-2	22-Jul-08	--	201	89	73
ML2-3	17-Jul-08	--	205	154	20
ML2-4	21-Jul-08	--	23.75	137	435
ML2-5	17-Jul-08	--	2.74	108	71
ML2-6	17-Jul-08	--	8.2	NA	29
ML2-7	17-Jul-08	--	3.1	248	49
ML3-2	17-Jul-08	--	129	250	99
ML3-3	22-Jul-08	--	231	702	7.5
ML3-4	18-Jul-08	--	74.5	196	166
ML3-5	21-Jul-08	--	108	483	10
ML3-6	18-Jul-08	--	92	375	32
ML3-7	21-Jul-08	--	18.25	157	178
ML4-2	23-Jul-08	--	245	177	34
ML4-3	21-Jul-08	--	44.75	227	133
ML4-4	21-Jul-08	--	14.25	171	363
ML4-5	21-Jul-08	--	9.2	198	NA
ML4-6	21-Jul-08	--	7.45	193	92
ML4-7	21-Jul-08	--	8.55	270	174
ML5-2	22-Jul-08	--	154	169	50
ML 5-3	18-Jul-08	--	61	254	156
ML5-4	18-Jul-08	--	5	88	NA
ML5-5	18-Jul-08	--	9.2	94	1850
ML5-6	18-Jul-08	--	159	168	1230
ML5-7	18-Jul-08	--	88	250	460
ML6-2	23-Jul-08	--	104	229	59
ML6-3	19-Jul-08	--	26.1	240	584
ML6-4	19-Jul-08	--	NA	89	4140
ML6-5	19-Jul-08	--	30.2	45	2900
ML6-7	19-Jul-08	--	NA	NA	NA
ML7-2	23-Jul-08	--	422.5	283	113
ML7-3	23-Jul-08	--	155	317	216
ML7-4	19-Jul-08	--	34.5	118	1000
ML7-5	19-Jul-08	--	74	47	1250
ML6-6	19-Jul-08	--	28.6	89	825
ML7-6	19-Jul-08	--	24	168	360
ML7-7	19-Jul-08	--	18.9	261	430

Notes:

mg/L - milligrams per litre

µg/L - micrograms per litre

-- - not measured

TABLE E-30: MARCH 2009 FIELD ANALYTICAL DATA
Parris Island, South Carolina

Geosyntec Consultants

Well I.D.	Date	Duplicate	Hach Fe ²⁺ (mg/L)	Alkalinity (CaCO ₃) (mg/L)	Hach S ²⁻ (µg/L)
PMW-1	4-Mar-09	--	54	238	75
PMW-2	4-Mar-09	--	--	--	--
PMW-3	4-Mar-09	--	11.5	71	548
PMW-4	5-Mar-09	--	23.3	77	19
PMW-5	5-Mar-09	--	96.0	42	2810
PMW-6	4-Mar-09	--	15.4	119	550
ML1-2	7-Mar-09	--	47.5	274	116
ML1-3	7-Mar-09	--	--	--	--
ML1-4	9-Mar-09	--	9.8	170	40
ML1-5	9-Mar-09	--	5.3	202	47
ML1-6	9-Mar-09	--	4.95	189	11
ML1-7	9-Mar-09	--	5.05	241	56
ML2-2	5-Mar-09	--	223	133	20
ML2-3	5-Mar-09	--	17.6	16	4.17
ML2-4	6-Mar-09	--	23.2	122	420
ML2-5	6-Mar-09	--	1.81	102	114
ML2-6	6-Mar-09	--	3.78	149	95
ML2-7	6-Mar-09	--	3.75	218	144
ML3-2	12-Mar-09	--	107	300	35
ML3-3	13-Mar-09	--	234	280	-3
ML3-4	14-Mar-09	--	81.5	157	50
ML3-5	14-Mar-09	--	47.75	514	31
ML3-6	14-Mar-09	--	66.5	406	42
ML3-7	14-Mar-09	--	16.8	156	54
ML4-2	11-Mar-09	--	173	516	38
ML4-3	11-Mar-09	--	61.5	251	126
ML4-4	12-Mar-09	--	10.1	142	299
ML4-5	12-Mar-09	--	10.6	181	102
ML4-6	12-Mar-09	--	9.5	185	167
ML4-7	12-Mar-09	--	9.1	261	129
ML5-2	6-Mar-09	--	146	171	46
ML 5-3	6-Mar-09	--	78.5	209	83
ML 5-3	6-Mar-09	Duplicate	75.5	213	77
ML5-4	7-Mar-09	--	4.45	77	2070
ML5-5	7-Mar-09	--	7.9	90	1210
ML5-6	7-Mar-09	--	9.2	119	990
ML5-7	7-Mar-09	--	5.5	194	215
ML6-2	10-Mar-09	--	250	316	7
ML6-3	10-Mar-09	--	69	274	138
ML6-4	11-Mar-09	--	4.65	98	2590
ML6-5	11-Mar-09	--	55.5	20	1650
ML6-6	11-Mar-09	--	33.25	59	960
ML6-7	11-Mar-09	--	14	165	442
ML7-2	9-Mar-09	--	405	316	167
ML7-3	9-Mar-09	--	228	324	34
ML7-4	10-Mar-09	--	44.5	108	734
ML7-5	10-Mar-09	--	146.5	38	463
ML7-6	10-Mar-09	--	39.5	157	284
ML7-7	10-Mar-09	--	15.8	335	306

Notes:

mg/L - milligrams per litre

µg/L - micrograms per litre

-- - not measured

TABLE E-31: GROUNDWATER VOC CONCENTRATION DATA
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
AW-2	12-Jun-05	--	NA	1,900	430	NA	350	28 J
ML-1-2	04-Oct-06	--	50 U	23,000	50 U	810	50 U	9,900
	20-Jan-07	--	200 U	86,000	200 U	2,000	1,200	13,000
	12-Jul-07	--	200 U	33,000	200 U	1,200	200 U	16,000
	17-Jan-08	--	52 J	81,000	200 U	2,300	2,200	15,000
	17-Jul-08	--	100 U	20,000	100 U	1,000	100 U	13,000
	07-Mar-09	--	500 U	70,000	500 U	1,700	500 U	12,000
ML-1-3	04-Oct-06	--	50 U	3,400	50 U	410	78	6,700
	30-Nov-06	--	50 U	13,000	50 U	920	50 U	18,000
	24-Mar-07	--	200 U	23,000	200 U	1,300	200 U	16,000
	18-Jan-08	--	100 U	14,000	100 U	980	43 J	12,000
	22-Jul-08	--	50 U	7,200	50 U	500	50 U	6,700
	07-Mar-09	--	100 U	16,000	100 U	790	100 U	6,900
ML-1-4	21-Aug-06	--	10 U	4,300	10 U	140	10 U	870
	20-Jan-07	--	40 U	11,000	40 U	630	100	12,000
	12-Jul-07	--	20 U	3,200	20 U	220	20 U	2,900
	18-Jan-08	--	4.0 J	3,500	20 U	240	20 U	2,900
	17-Jul-08	--	25 U	3,900	25 U	190	25 U	1,500
	09-Mar-09	--	20 U	3,000	20 U	200	20 U	2,000
ML-1-5	04-Oct-06	--	1.0 U	14	11	18	1.0 U	120
	13-Oct-06	--	2.0 U	80	22	40	15	670
	30-Nov-06	--	1.4	1,500	1.8	110	27	2,300
	24-Mar-07	--	50 U	7,400	210	440	50 U	8,400
	12-Jul-07	--	20 U	1,200	20 U	110	20 U	2,000
	18-Jan-08	--	20 U	2,100	20 U	150	6.0 J	1,800
	22-Jul-08	--	10 U	1,500	10 U	95	10 U	1,300
	09-Mar-09	--	10 U	1,900	10 U	120	10 U	1,200
ML-1-6	21-Aug-06	--	2.5 U	440	2.5	15	2.8	65
	20-Jan-07	--	2.0 U	320	2.8	27	2.9	290
	12-Jul-07	--	2.0 U	510	1.4 J	28	2.7	220
	17-Jul-08	--	25 U	2,700	25 U	93	5.2 J	380
	09-Mar-09	--	25 U	3,100	25 U	57	43	280
ML-1-7	04-Oct-06	--	1.0 U	100	10	4.0	1.0 U	43
	30-Nov-06	--	5.0 U	1,100	5.0 U	32	5.0 U	400
	24-Mar-07	--	1.0 U	170	1.0 U	13	1.0 U	210
	13-Jul-07	--	5.0 U	980	5.0 U	30	5.0 U	340
	18-Jan-08	--	2.0 U	330	2.0 U	17	0.54 J	150
	09-Mar-09	--	1.0 U	170	1.0 U	8.2	4.5	65
ML-2-2	22-Aug-06	--	500 U	160,000	6,500	850	9,800	1,200
	20-Jan-07	--	1,000 U	100,000	1,000 U	1,000 U	1,000 U	4,700
	12-Jul-07	--	1,000 U	150,000	1,000 U	550 J	1,700	26,000
	22-Jul-08	--	500 U	130,000	240 J	820	630	100,000
	05-Mar-09	--	500 U	66,000	510	500 U	500 U	35,000
ML-2-3	22-Aug-06	--	500 U	92,000	7,300	500	11,000	500 U
	05-Oct-06	--	250 U	130,000	16,000	930	20,000	1,000
	01-Dec-06	--	500 U	78,000	1,600	500 U	2,700	600
	20-Jan-07	--	500 U	120,000	2,000	500 U	1,500	2,600
	21-Mar-07	--	1,000 U	140,000	1,000 U	1,000 U	1,000 U	11,000
	18-Jan-08	--	500 U	69,000	240 J	200 J	540	30,000
	17-Jul-08	--	500 U	54,000	500 U	180 J	120 J	22,000
	05-Mar-09	--	250 U	59,000	250 U	330	250 U	25,000
ML-2-4	21-Aug-06	--	250 U	23,000	49,000	320	36,000	460
	21-Jan-07	--	400 U	110,000	9,400	660	11,000	5,700
	13-Jul-07	--	1,000 U	120,000	1,300	970 J	15,000	43,000
	20-Jan-08	--	120 J	69,000	240 J	520	2,900	42,000
	21-Jul-08	--	500 U	72,000	500 U	420 J	1,000	32,000
	21-Jul-08	Duplicate	500 U	77,000	500 U	440 J	1,100	34,000
	06-Mar-09	--	250 U	59,000	250 U	360	580	19,000
ML-2-5	22-Aug-06	--	500 U	3,100	180,000	500 U	4,700	500 U
	05-Oct-06	--	500 U	9,200	89,000	500 U	10,000	500 U
	13-Oct-06	--	500 U	8,500	100,000	500 U	8,700	500 U
	01-Dec-06	--	500 U	5,900	190,000	500 U	3,900	500 U
	21-Jan-07	--	1,000 U	8,100 J	840,000 J	1,000 U	7,700 J	1,000 U
	22-Mar-07	--	1,000 U	7,700	190,000	1,000 U	6,900	1,000 U
	13-Jul-07	--	1,000 U	9,600	150,000	1,000 U	7,700	1,100
	20-Jan-08	--	1,000 U	6,100	150,000	1,000 U	8,100	1,400
	17-Jul-08	--	1,000 U	7,000	100,000	1,000 U	7,100	2,400
	06-Mar-09	--	1,000 U	12,000	110,000	1,000 U	29,000	1,700

TABLE E-31: GROUNDWATER VOC CONCENTRATION DATA
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
ML-2-6	21-Aug-06	--	500 U	5,200	46,000	500 U	21,000	500 U
	21-Jan-07	--	400 U	6,100	120,000	400 U	6,900	400 U
	13-Jul-07	--	1,000 U	7,900	110,000	1,000 U	6,400	900 J
	20-Jan-08	--	1,000 U	10,000	130,000	1,000 U	7,200	830 J
	17-Jul-08	--	1,000 U	15,000	130,000	1,000 U	8,800	1,100
	06-Mar-09	--	1,300 U	22,000	130,000	1,300 U	10,000	2,000
ML-2-7	05-Oct-06	--	500 U	38,000	82,000	500 U	12,000	500 U
	02-Dec-06	--	500 U	29,000	130,000	500 U	14,000	740
	22-Mar-07	--	1,000 U	14,000	180,000	1,000 U	4,700	310 J
	13-Jul-07	--	2,000 U	16,000	180,000	2,000 U	5,800	2,000 U
	20-Jan-08	--	2,000 U	27,000	190,000	2,000 U	10,000	940 J
	17-Jul-08	--	2,000 U	27,000	230,000	2,000 U	9,600	1,400 J
	06-Mar-09	--	1,300 U	33,000	180,000	1,300 U	13,000	1,300 U
ML-3-2	22-Aug-06	--	50 U	4,800	50 U	500	50 U	12,000
	21-Jan-07	--	2.0 U	180 J	67 J	12 J	9.5 J	240 J
	13-Jul-07	--	1.0 U	87	11	7.1	2.2	160
	17-Jul-08	--	1.0 U	5.5	0.41 J	0.22 J	1.0 U	1.3
	12-Mar-09	--	1.0 U	1.0 U	1.0 U	1.2	1.0 U	1.8
ML-3-3	22-Aug-06	--	50 U	4,800	50 U	650	50 U	9,600
	04-Dec-06	--	2.0 U	40	66	11	19	210
	21-Jan-07	--	1.0 U	21	7.6	12	2.6	70
	26-Mar-07	--	1.0 U	23	1.7	9.3	1.0 U	46
	20-Jan-08	--	1.0 U	0.72 J	0.33 J	1.3	1.0 U	17
	13-Mar-09	--	1.0 U	1.0 U	1.0 U	3.3	1.0 U	2.8
ML-3-4	22-Aug-06	--	10 U	1,100	10 U	110	10 U	1,800
	21-Jan-07	--	5.0 U	650	12	24	5.0 U	280
	14-Jul-07	--	1.0 U	58	3.3 U	4.3	2.4	79
	21-Jan-08	--	1.0 U	11	1.4 U	1.0	1.1	25
	18-Jul-08	--	1.0 U	4.4	0.45 J	1.2	0.46 J	21
	14-Mar-09	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.8
ML-3-5	22-Aug-06	--	2.0 U	330	2.0 U	26	3.2	330
	04-Oct-06	--	2.0 U	380	11	29	16	250
	13-Oct-06	--	2.0 U	200	20	13	6.9	89
	04-Dec-06	--	1.0 U	140	37	7.3	17 J	95
	27-Mar-07	--	2.0 U	68	3.4	3.9	2.0 U	110
	14-Jul-07	--	1.0 U	37	1.1 U	2.0	1.0 U	56
	21-Jan-08	--	1.0 U	4.3	0.47 J	0.59 J	0.61 J	8.9
	14-Mar-09	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4
ML-3-6	22-Aug-06	--	5.0 U	450	5.0 U	46	5.0 U	910
	21-Jan-07	--	5.0 U	22	16	5.0 U	5.0 U	8.9
	14-Jul-07	--	1.0 U	5.3	1.0 U	1.0 U	1.0 U	2.0
	18-Jul-08	--	1.0 U	2.3	0.77 J	1.0 U	0.21 J	2.1
	14-Mar-09	--	1.0 U	2.3	1.0 U	1.0 U	1.0 U	1.9
ML-3-7	04-Oct-06	--	2.0 U	130	13	18	2.1	230
	04-Dec-06	--	2.0 U	16	14	7.4	2.6 J	64
	22-Jan-07	--	2.0 U	10	2.0 U	5.0	2.0 U	30
	27-Mar-07	--	1.0 U	6.2	1.0 U	3.8	1.0 U	20
	14-Jul-07	--	1.0 U	2.0	1.0 U	2.8	1.0 U	25
	21-Jan-08	--	1.0 U	0.28 J	0.52 J	2.2	1.0 U	5.5
	14-Mar-09	--	7.2	2,000	13,000	18	2,200	260
ML-4-2	22-Aug-06	--	200 U	58,000	200 U	1,500	200 U	9,200
	22-Jan-07	--	250 U	2,000	250 U	880	250 U	35,000
	14-Jul-07	--	50 U	50 U	50 U	240	50 U	13,000
	21-Jan-08	--	20 U	23	20 U	20 U	20 U	2,300
	11-Mar-09	--	2.5 U	68	2.5 U	33	2.5 U	490
ML-4-3	04-Oct-06	--	100 U	49,000	100 U	2,000	1,400	7,200
	29-Nov-06	--	250 U	38,000	250 U	1,700	400	9,000
	22-Mar-07	--	200 U	40,000	770	2,500	330	27,000
	22-Jan-08	--	100 U	7,300	100 U	960	100 U	11,000
	21-Jul-08	--	25 U	1,400	13 J	400	25 U	3,900
	11-Mar-09	--	50 U	7,200	50 U	690	50 U	8,600
ML-4-4	24-Aug-06	--	200 U	31,000	200 U	910	200 U	3,700
	23-Jan-07	--	100 U	12,000	540	770	1,600	13,000
	16-Jul-07	--	20 U	120	20 U	200	20 U	3,500
	12-Mar-09	--	5.0 U	530	5.0 U	69	5.0 U	970

TABLE E-31: GROUNDWATER VOC CONCENTRATION DATA
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
ML-4-5	04-Oct-06	--	25 U	8,800	2,800	140	3,100	1,200
	13-Oct-06	--	50 U	9,800	1,500	120	2,000	970
	29-Nov-06	--	100 U	3,400	10,000	100 U	4,600	1,100
	23-Mar-07	--	100 U	16,000	2,500	140	1,200	6,000
	16-Jul-07	--	20 U	810	20 U	22	20 U	3,300
	16-Jul-07	Duplicate	20 U	890	20 U	19 J	20 U	3,800
	22-Jan-08	--	5.0 J	1,900	20 U	22	170	2,000
	21-Jul-08	--	10 U	470	10 U	14	10 U	1,400
	12-Mar-09	--	5.0 U	800	5.0 U	29	63	740
ML-4-6	24-Aug-06	--	50 U	5,100	50 U	64	50 U	280
	23-Jan-07	--	50 U	12,000	2,400	110	2,500	3,000
	16-Jul-07	--	50 U	140	50 U	54	50 U	6,400
	22-Jan-08	--	20 U	790	20 U	18 J	61	2,000
	12-Mar-09	--	5.0 U	480	5.0 U	21	13	1,200
ML-4-7	04-Oct-06	--	5.0 U	990	6.8	19	5.0 U	200
	30-Nov-06	--	10 U	2,000	1,600	51	1,700	1,200
	23-Mar-07	--	50 U	6,600	50 U	76	50 U	4,700
	16-Jul-07	--	10 U	97	10 U	11	10 U	2,600
	22-Jan-08	--	10 U	18	10 U	11	10 U	930
	12-Mar-09	--	2.5 U	10	2.5 U	3.7	2.5 U	330
ML-5-2	23-Aug-06	--	250 U	100,000	380	1,700	250 U	1,300
	23-Jan-07	--	500 U	37,000	500 U	1,900	500 U	59,000
	16-Jul-07	--	400 U	130 J	400 U	510	400 U	43,000
	22-Jan-08	--	100 U	160	100 U	170	100 U	17,000
	22-Jul-08	--	50 U	260	50 U	84	50 U	9,600
	06-Mar-09	--	100 U	100 U	100 U	110	100 U	12,000
ML-5-3	23-Aug-06	--	500 U	130,000	1,300	4,100	500 U	5,700
	05-Oct-06	--	250 U	110,000	250 U	4,600	2,700	3,300
	29-Nov-06	--	1,000 U	100,000	1,000 U	3,800	2,000	10,000
	23-Mar-07	--	500 U	100,000	500 U	3,600	1,700	29,000
	22-Jan-08	--	500 U	46,000	500 U	2,300	500 U	32,000
	18-Jul-08	--	250 U	28,000	250 U	1,800	250 U	48,000
	06-Mar-09	--	200 U	4,200	200 U	720	200 U	15,000
	06-Mar-09	Duplicate	100 U	3,700	100 U	700	100 U	17,000
ML-5-4	23-Aug-06	--	200 U	31,000	340	440	960	400
	23-Jan-07	--	100 U	16,000	100 U	180	130	2,800
	23-Jan-07	Duplicate	100 U	16,000	100 U	180	150	2,700
	16-Jul-07	--	100 U	19,000	100 U	130	100 U	4,200
	18-Jul-08	--	25 U	4,400	25 U	86	25 U	1,700
	07-Mar-09	--	25 U	13,000	25 U	120	25 U	4,900
ML-5-5	23-Aug-06	--	100 U	34,000	140	270	350	160
	05-Oct-06	--	200 U	25,000	4,900	360	3,200	430
	13-Oct-06	--	100 U	22,000	7,300	200	2,700	330
	29-Nov-06	--	200 U	21,000	7,600	200	3,800	1,000
	29-Nov-06	Duplicate	100 U	21,000	7,300	220	3,600	1,200
	23-Mar-07	--	200 U	30,000	200 U	210	200 U	6,200
	16-Jul-07	--	200 U	32,000	200 U	150 J	200 U	7,400
	22-Jan-08	--	44 J	31,000	200 U	160 J	200 U	5,000
	18-Jul-08	--	200 U	25,000	200 U	100 J	200 U	6,700
	07-Mar-09	--	200 U	25,000	200 U	200 U	200 U	10,000
ML-5-6	23-Aug-06	--	50 U	11,000	50 U	120	50 U	110
	24-Aug-06	Duplicate	100 U	12,000	100 U	120	100 U	100
	23-Jan-07	--	100 U	4,000	100 U	140	100 U	14,000
	16-Jul-07	--	100 U	11,000	100 U	110	100 U	11,000
	23-Jan-08	--	100 U	9,600	100 U	100	100 U	13,000
	18-Jul-08	--	100 U	9,800	100 U	75 J	100 U	9,000
	07-Mar-09	--	50 U	8,300	50 U	76	50 U	7,900
ML-5-7	23-Aug-06	--	10 U	1,800	10 U	28	10 U	30
	29-Nov-06	--	23	12,000	4,100	140	1,400	1,800
	23-Mar-07	--	50 U	9,800	1,000	94	120	7,800
	16-Jul-07	--	9.5 J	4,300	1,200	43	210	4,000
	23-Jan-08	--	50 U	4,900	3,600	50 J	550	6,200
	18-Jul-08	--	9.0 J	1,300	3,300	16 J	750	1,600
	07-Mar-09	--	25 U	1,400	3,400	25 U	680	2,100

TABLE E-31: GROUNDWATER VOC CONCENTRATION DATA
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
ML-6-2	24-Aug-06	--	500 U	90,000	500 U	1,300	500 U	760
	23-Jan-07	--	500 U	66,000	500 U	1,600	500 U	35,000
	17-Jul-07	--	50 U	120	50 U	59	50 U	9,000
	23-Jul-08	--	10 U	21	10 U	16	10 U	1,000
	10-Mar-09	--	10 U	33	10 U	30	10 U	980
ML-6-3	05-Oct-06	--	250 U	71,000	3,500	2,200	10,000	1,900
	29-Nov-06	--	500 U	75,000	1,700	2,000	8,600	3,600
	27-Mar-07	--	200 U	75,000	200 U	2,600	200 U	22,000
	23-Jan-08	--	250 U	20,000	250 U	1,900	250 U	43,000
	19-Jul-08	--	200 U	36,000	200 U	1,000	200 U	33,000
	10-Mar-09	--	100 U	14,000	100 U	910	100 U	12,000
ML-6-4	24-Aug-06	--	200 U	26,000	210	260	2,200	200 U
	24-Jan-07	--	200 U	38,000	200 U	290	200 U	6,200
	17-Jul-07	--	200 U	28,000	200 U	190 J	200 U	12,000
	23-Jan-08	--	82 J	57,000	200 U	350	440	13,000
	23-Jan-08	Duplicate	500 U	54,000	500 U	320 J	360 J	13,000
	19-Jul-08	--	100 U	12,000	100 U	95 J	100 U	6,200
	11-Mar-09	--	80 U	10,000	80 U	110	80 U	5,500
	05-Oct-06	--	250 U	15,000	39,000	250 U	6,900	250 U
ML-6-5	05-Oct-06	Duplicate	500 U	16,000	48,000	500 U	8,400	500 U
	13-Oct-06	--	200 U	13,000	42,000	200 U	6,200	200 U
	29-Nov-06	--	250 U	28,000	16,000	250 U	5,700	440
	26-Mar-07	Duplicate	200 U	77,000	200 U	350	3,700	8,400
	27-Mar-07	--	400 U	73,000	400 U	430	3,400	10,000
	17-Jul-07	--	400 U	69,000	400 U	350 J	400 U	14,000
	23-Jan-08	--	140 J	83,000	280 J	480 J	4,400	11,000
	19-Jul-08	--	500 U	53,000	500 U	260 J	500 U	13,000
	11-Mar-09	--	500 U	72,000	500 U	500 U	500 U	6,900
ML-6-6	24-Aug-06	--	100 U	12,000	100 U	110	280	100 U
	24-Jan-07	--	100 U	59,000	100 U	260	100 U	4,200
	17-Jul-07	--	400 U	46,000	400 U	270 J	400 U	18,000
	23-Jan-08	--	500 U	46,000	500 U	280 J	780	17,000
	19-Jul-08	--	200 U	20,000	200 U	130 J	200 U	25,000
	11-Mar-09	--	250 U	28,000	250 U	250 U	250 U	19,000
	05-Oct-06	--	10 U	2,200	10 U	41	10 U	68
ML-6-7	29-Nov-06	--	25 U	8,100	1,200	75	990	620
	28-Mar-07	--	100 U	25,000	1,500	170	170	14,000
	17-Jul-07	--	100 U	3,200	1,800	69 J	270	12,000
	23-Jan-08	--	22 J	9,600	2,200	87 J	320	12,000
	19-Jul-08	--	50 U	5,100	2,600	46 J	560	8,800
	11-Mar-09	--	50 U	6,900	2,300	70	1,100	9,300
	23-Aug-06	--	250 U	73,000	250 U	1,800	250 U	8,700
ML-7-2	24-Jan-07	--	100 U	580	100 U	170	100 U	12,000
	17-Jul-07	--	50 U	240	50 U	87	50 U	7,900
	23-Jul-08	--	50 U	100	50 U	39 J	50 U	8,600
	09-Mar-09	--	50 U	230	50 U	50 U	50 U	7,900
ML-7-3	23-Aug-06	--	250 U	110,000	250 U	2,900	250 U	8,200
	05-Oct-06	--	200 U	100,000	200 U	3,500	200 U	13,000
	02-Dec-06	--	250 U	47,000	250 U	1,700	250 U	32,000
	24-Jan-07	--	250 U	34,000	250 U	1,400	250 U	42,000
	28-Mar-07	--	200 U	10,000	200 U	1,300	200 U	58,000
	23-Jan-08	--	100 U	7,800	100 U	640	100 U	13,000
	09-Mar-09	--	40 U	7,500	40 U	360	40 U	5,900
ML-7-4	23-Aug-06	--	200 U	55,000	200 U	750	2,000	760
	24-Jan-07	--	50 U	3,800	50 U	90	50 U	5,600
	18-Jul-07	--	50 U	6,000	50 U	110	50 U	17,000
	23-Jan-08	--	16 J	15,000	50 U	77 J	50 U	10,000
	19-Jul-08	--	48 J	34,000	100 U	200	100 U	24,000
	10-Mar-09	--	200 U	32,000	200 U	200 U	200 U	13,000
ML-7-5	23-Aug-06	--	200 U	28,000	28,000	200	12,000	200 U
	05-Oct-06	--	500 U	11,000	65,000	500 U	10,000	500 U
	13-Oct-06	--	500 U	3,800	78,000	500 U	8,400	500 U
	04-Dec-06	--	200 U	33,000	1,800	200 U	6,000 J	4,200
	25-Jan-07	--	100 U	14,000	100 U	100 U	570	2,600
	28-Mar-07	--	200 U	30,000	200 U	200 U	200 U	2,800
	18-Jul-07	--	200 U	50,000	200 U	110 J	200 U	4,700
	24-Jan-08	--	40 J	43,000	100 U	100 J	100 U	3,400
	10-Mar-09	--	500 U	64,000	500 U	500 U	500 U	2,800
	05-Oct-06	--	500 U	11,000	65,000	500 U	10,000	500 U

TABLE E-31: GROUNDWATER VOC CONCENTRATION DATA
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
ML-7-6	24-Aug-06	--	200 U	27,000	270	200 U	790	200 U
	25-Jan-07	--	50 U	7,500	50 U	72	50 U	9,600
	18-Jul-07	--	50 U	3,200	50 U	63	50 U	19,000
	24-Jan-08	--	12 J	14,000	50 U	56 J	50 U	16,000
	19-Jul-08	--	100 U	14,000	100 U	79 J	100 U	24,000
	10-Mar-09	--	100 U	11,000	100 U	100 U	100 U	17,000
ML-7-7	24-Aug-06	--	50 U	7,200	50 U	51	50 U	50 U
	04-Dec-06	--	50 U	18,000	66	140	330	6,700
	25-Jan-07	--	50 U	230	50 U	50 U	50 U	10,000
	29-Mar-07	--	50 U	1,200	50 U	56	50 U	12,000
	18-Jul-07	--	50 U	4,900	50 U	38 J	50 U	7,200
	24-Jan-08	--	100 U	7,100	100 U	34 J	100 U	10,000
	10-Mar-09	--	5.0 U	89	5.0 U	5.0 U	5.0 U	770
MW-08 SU	12-Jun-05	--	NA	2,700	19,000	NA	5,400	200 U
MW-22 SU	12-Jun-05	--	NA	10,000	200 U	NA	200	3,100
PMW-1	04-Oct-06	--	10 U	4,900	310	75	210	390
	30-Nov-06	--	25 U	17,000	320	280	610	2,000
	19-Jan-07	--	50 U	22,000	190	390	330	5,800
	26-Mar-07	--	100 U	14,000	300	170	180	5,800
	11-Jul-07	--	50 U	4,800	170	100	180	6,000
	16-Jan-08	--	20 U	2,500	390	41	320	2,100
	16-Jul-08	--	0.68 J	1,000	31	17	33	430
	04-Mar-09	--	10 U	1,800	76	36	86	780
	04-Mar-09	Duplicate	10 U	1,600	68	36	81	660
PMW-2	04-Oct-06	--	2.0 U	310	2.7	24	2.8	210
	30-Nov-06	--	2.0 U	460	2.0 U	37	2.0 U	330
	26-Mar-07	--	5.0 U	590	5.0 U	47	5.0 U	610
	11-Jul-07	--	4.0 U	440	4.0 U	42	4.0 U	280
	16-Jan-08	--	0.54 J	330	2.0 U	36	2.0 U	310
	16-Jul-08	--	2.0 U	160	2.0 U	18	2.0 U	200
	04-Mar-09	--	1.0 U	200	1.0 U	25	1.0 U	200
	04-Mar-09	--	1.0 U	200	1.0 U	25	1.0 U	200
PMW-3	21-Aug-06	--	200 U	44,000	20,000	1,300	3,600	2,700
	10-Oct-06	--	250 U	27,000	22,000	800	5,700	1,200
	10-Oct-06	Duplicate	200 U	21,000	33,000	660	6,800	990
	12-Oct-06	--	250 U	28,000	26,000	1,000	12,000	2,000
	29-Nov-06	--	250 U	17,000	43,000	270	13,000	790
	19-Jan-07	--	400 U	40,000	4,900	400 U	1,700	970
	21-Mar-07	--	32 J	41,000	62 J	330	49 J	3,200
	11-Jul-07	--	200 U	25,000	1,200	250	1,800	3,200
	11-Jul-07	Duplicate	200 U	22,000	2,100	180 J	3,000	2,500
	16-Jan-08	--	48 J	38,000	520	240	510	4,200
	16-Jan-08	Duplicate	50 J	39,000	450	230	470	4,200
	16-Jul-08	--	50 U	8,800	720	100	1,100	2,200
	16-Jul-08	Duplicate	12 J	8,900	740	110	1,200	2,600
	04-Mar-09	--	100 U	13,000	890	150	830	5,000
PMW-4	04-Oct-06	--	200 U	15,000	59,000	710	14,000	200 U
	01-Dec-06	--	500 U	20,000	59,000	1,000	17,000	500 U
	21-Mar-07	--	500 U	27,000	56,000	1,200	18,000	160 J
	12-Jul-07	--	500 U	18,000	72,000	820	17,000	500 U
	17-Jan-08	--	500 U	30,000	68,000	1,200	22,000	220 J
	16-Jul-08	--	250 U	6,100	35,000	210 J	10,000	250 U
	05-Mar-09	--	500 U	38,000	74,000	1,400	27,000	500 U
	05-Mar-09	--	500 U	38,000	74,000	1,400	27,000	500 U
PMW-5	21-Aug-06	--	500 U	19,000	76,000	500 U	21,000	500 U
	21-Aug-06	Duplicate	500 U	20,000	78,000	500 U	22,000	500 U
	05-Oct-06	--	500 U	26,000	76,000	500 U	17,000	500 U
	13-Oct-06	--	500 U	50,000	57,000	500	26,000	500 U
	02-Dec-06	--	250 U	47,000	32,000	250 U	17,000 J	250 U
	02-Dec-06	Duplicate	500 U	58,000	40,000	500 U	20,000 J	500 U
	19-Jan-07	--	500 U	59,000	30,000	500 U	12,000	500 U
	21-Mar-07	--	500 U	56,000	32,000	280 J	18,000	170 J
	21-Mar-07	Duplicate	200 U	65,000	33,000	270	18,000	190 J
	12-Jul-07	--	500 U	82,000	24,000	420 J	14,000	930
	17-Jan-08	--	140 J	82,000	27,000	400 J	14,000	2,500
	16-Jul-08	--	120 J	82,000	28,000	360 J	17,000	1,500
	05-Mar-09	--	500 U	81,000	33,000	500 U	18,000	4,200
	05-Mar-09	Duplicate	500 U	89,000	35,000	500 U	18,000	4,600
PMW-6	21-Aug-06	--	100 U	9,400	300	370	570	1,400
	04-Oct-06	--	20 U	8,500	310	290	620	730
	13-Oct-06	--	20 U	8,300	180	290	490	710
	02-Dec-06	--	50 U	5,600	760	130	600 J	780
	19-Jan-07	--	40 U	4,300	2,300	130	1,000	3,000
	19-Jan-07	Duplicate	40 U	4,200	2,300	110	1,000	3,000
	21-Mar-07	--	20 U	3,000	1,800	110	510	3,500
	12-Jul-07	--	10 U	840	52	48	120	1,400
	17-Jan-08	--	2.0 J	860	51	82	170	780
	17-Jan-08	Duplicate	1.9 J	800	55	62	180	720
	16-Jul-08	--	1.0 U	150	1.0 U	18	1.0 U	160
	04-Mar-09	--	2.0 U	180 J	2.0 U	19 J	18 J	230 J
	04-Mar-09	--	2.0 U	180 J	2.0 U	19 J	18 J	230 J
	04-Mar-09	--	2.0 U	180 J	2.0 U	19 J	18 J	230 J

TABLE E-31: GROUNDWATER VOC CONCENTRATION DATA
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
TW-1	11-Jun-05	--	NA	100	110	NA	340	7.5
	11-Jun-05	--	NA	13	2.5	NA	6.8	6.1
	11-Jun-05	--	NA	68,000	8,400	NA	29,000	13,000
TW-2	12-Jun-05	--	NA	560 J	71,000	NA	2,600	1,000 U
	12-Jun-05	--	NA	100 U	6,700	NA	130	100 U
	12-Jun-05	--	NA	29,000	53,000	NA	38,000	2,000
TW-3	12-Jun-05	--	NA	44	19	NA	0.79 J	1.7
	12-Jun-05	Duplicate	NA	50	21	NA	0.72 J	2.2
	12-Jun-05	--	NA	85	62	NA	0.91 J	17
TW-4	12-Jun-05	--	NA	200 U	8,800	NA	440	3.4
	12-Jun-05	--	NA	29	180	NA	36	11
	12-Jun-05	--	NA	5,600	12,000	NA	6,700	200 U
Trip Blank	21-Aug-06	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	24-Aug-06	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	05-Oct-06	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	29-Nov-06	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	19-Jan-07	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	23-Jan-07	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	24-Jan-07	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	21-Mar-07	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	24-Mar-07	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	26-Mar-07	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11-Jul-07	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	13-Jul-07	--	1.0 U	1.0 U	1.0	1.0 U	1.0 U	1.0 U
	18-Jul-07	--	1.0 U	0.30 J	0.50 J	1.0 U	1.0 U	1.0 U
	20-Jan-08	--	1.0 U	1.0 U	0.29 J	1.0 U	1.0 U	1.0 U
	22-Jan-08	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	22-Jan-08	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	22-Jan-08	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	16-Jul-08	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	18-Jul-08	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	22-Jul-08	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	04-Mar-09	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	06-Mar-09	--	1.0 U	1.5	1.0 U	1.0 U	1.0 U	1.0 U
	09-Mar-09	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	10-Mar-09	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	13-Mar-09	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	20-Mar-09	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	20-Mar-09	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Notes:

All results in µg/L

µg/L - micrograms per liter

NA - not analyzed

"U" - not detected (reported at detection limit)

"J" - estimated result

TABLE E-32: GROUNDWATER DHG CONCENTRATION DATA
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	Acetylene (mg/L)	Ethane (mg/L)	Ethene (mg/L)	Methane (mg/L)
ML-1-2	04-Oct-06	--	0.003 U	0.001 U	1.4	2.0
	20-Jan-07	--	0.003 U	0.001 U	1.8	2.2
	12-Jul-07	--	0.003 U	0.001 U	1.3	2.1
	17-Jan-08	--	0.003 U	0.001 U	1.3	7.3
	17-Jul-08	--	0.003 U	0.001 U	1.1	10
	07-Mar-09	--	0.002 U	0.011	1.7	17
ML-1-3	27-Jun-06	--	NA	0.00035 U	0.20	0.79
	04-Oct-06	--	0.003 U	0.001 U	0.82	1.5
	30-Nov-06	--	0.003 U	0.001 U	1.7	1.5
	24-Mar-07	--	0.003 U	0.001 U	1.2	1.5
	18-Jan-08	--	0.003 U	0.001 U	1.1	8.7
	22-Jul-08	--	0.003 U	0.001 U	0.69	9.5
	07-Mar-09	--	0.002 U	0.0080	1.2	16
ML-1-4	21-Aug-06	--	NA	0.01 U	0.22	0.84
	20-Jan-07	--	0.003 U	0.001 U	1.0	1.2
	12-Jul-07	--	0.003 U	0.001 U	0.41	2.1
	18-Jan-08	--	0.003 U	0.001 U	0.49	9.0
	17-Jul-08	--	0.003 U	0.001 U	0.15 J	12
	09-Mar-09	--	0.002 U	0.0038	0.38	15
ML-1-5	04-Oct-06	--	0.003 U	0.001 U	0.34	0.16
	30-Nov-06	--	0.003 U	0.001 U	0.26	0.12
	24-Mar-07	--	0.003 U	0.001 U	0.37	0.59
	12-Jul-07	--	0.003 U	0.001 U	0.40	2.6
	18-Jan-08	--	0.003 U	0.001 U	0.19	8.5
	22-Jul-08	--	0.003 U	0.001 U	0.49	16
	09-Mar-09	--	0.002 U	0.0038	0.24	18
ML-1-6	21-Aug-06	--	NA	0.002 U	0.0079	0.16
	20-Jan-07	--	0.003 U	0.001 U	0.0070	0.028
	12-Jul-07	--	0.003 U	0.001 U	0.0070	0.75
	17-Jul-08	--	0.003 U	0.0019	0.026	4.2
	09-Mar-09	--	0.002 U	0.0023	0.028	17
ML-1-7	04-Oct-06	--	0.003 U	0.001 U	0.0029	1.0
	30-Nov-06	--	0.003 U	0.001 U	0.027	0.85
	24-Mar-07	--	0.003 U	0.001 U	0.0083	1.3
	13-Jul-07	--	0.003 U	0.00021 J	0.011	4.1
	18-Jan-08	--	0.003 U	0.0021	0.018	7.7
	09-Mar-09	--	0.002 U	0.026	0.017	11
ML-2-2	22-Aug-06	--	NA	0.005 U	0.17	0.44
	20-Jan-07	--	0.003 U	0.46	1.7	0.79
	12-Jul-07	--	0.0056	1.8	5.4	0.72
	22-Jul-08	--	0.003 U	1.9	12	0.57
	05-Mar-09	--	0.017	2.0	16	0.41
ML-2-3	22-Aug-06	--	NA	0.01 U	0.091	0.72
	05-Oct-06	--	0.003 U	0.00054 J	0.21	1.1
	01-Dec-06	--	0.11 J	0.34	1.8	0.12
	20-Jan-07	--	0.058	0.57	2.6	0.090
	21-Mar-07	--	0.029	0.74	3.4	0.079
	18-Jan-08	--	0.037	0.74	4.7	0.052
	17-Jul-08	--	0.036	0.79	5.0	0.072
	05-Mar-09	--	0.002 U	0.61	6.1	0.49
ML-2-4	21-Aug-06	--	NA	0.01 U	0.11	0.73
	21-Jan-07	--	0.003 U	0.048	0.37	0.47
	13-Jul-07	--	0.003 U	0.21	1.5	0.41
	20-Jan-08	--	0.003 U	0.72	7.3	0.57
	21-Jul-08	--	0.003 U	0.72	5.5	0.62
	21-Jul-08	Duplicate	0.003 U	0.67	4.8	0.54
	06-Mar-09	--	0.002 U	0.70	4.6	0.63
ML-2-5	22-Aug-06	--	NA	0.001 U	0.0053	0.074
	05-Oct-06	--	0.003 U	0.001 U	0.0023	0.061
	01-Dec-06	--	0.003 U	0.0018	0.0057	0.063
	21-Jan-07	--	0.003 U	0.013	0.022	0.053
	22-Mar-07	--	0.003 U	0.016	0.033	0.048
	13-Jul-07	--	0.003 U	0.014	0.033	0.053
	20-Jan-08	--	0.003 U	0.016	0.17	0.044
	17-Jul-08	--	0.003 U	0.058	0.61	0.081
	06-Mar-09	--	0.002 U	0.038	0.16	0.092
ML-2-6	21-Aug-06	--	NA	0.002 U	0.0042	0.11
	21-Jan-07	--	0.003 U	0.017	0.056	0.064
	13-Jul-07	--	0.003 U	0.021	0.041	0.076
	20-Jan-08	--	0.003 U	0.019	0.097	0.070
	17-Jul-08	--	0.003 U	0.025	0.14	0.073
	06-Mar-09	--	0.002 U	0.052	0.37	0.096

TABLE E-32: GROUNDWATER DHG CONCENTRATION DATA
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	Acetylene (mg/L)	Ethane (mg/L)	Ethene (mg/L)	Methane (mg/L)
ML-2-7	05-Oct-06	--	0.003 U	0.001 U	0.0033	0.29
	02-Dec-06	--	0.003 U	0.0083	0.047	0.24
	22-Mar-07	--	0.003 U	0.015	0.038	0.17
	13-Jul-07	--	0.003 U	0.022	0.061	0.28
	20-Jan-08	--	0.003 U	0.021	0.11	0.34
	17-Jul-08	--	0.003 U	0.039	0.25	0.36
	06-Mar-09	--	0.002 U	0.049	0.31	0.50
ML-3-2	22-Aug-06	--	NA	0.025 U	2.2	2.2
	21-Jan-07	--	0.003 U	0.092	0.32	2.3
	13-Jul-07	--	0.003 U	0.16	0.53	8.1
	17-Jul-08	--	0.003 U	0.0019	0.012	3.0
	13-Mar-09	--	0.002 U	0.0014	0.017	16
ML-3-3	22-Aug-06	--	NA	0.05 U	2.7	2.7
	04-Dec-06	--	0.003 U	0.047	0.28	1.3
	21-Jan-07	--	0.003 U	0.074	0.32	5.4
	26-Mar-07	--	0.003 U	0.056	0.18	5.0
	20-Jan-08	--	0.003 U	0.024	0.086	14
	13-Mar-09	--	0.002 U	0.0016	0.014	22
ML-3-4	22-Aug-06	--	NA	0.01 U	0.49	0.74
	21-Jan-07	--	0.003 U	0.0039	0.038	7.5
	14-Jul-07	--	0.003 U	0.0026	0.0091	10
	21-Jan-08	--	0.003 U	0.00047 J	0.0013	12
	18-Jul-08	--	0.003 U	0.001 U	0.026	13
	14-Mar-09	--	0.002 U	0.0015	0.0075	23
ML-3-5	22-Aug-06	--	NA	0.002 U	0.096	0.18
	04-Oct-06	--	0.003 U	0.001 U	0.058	0.18
	04-Dec-06	--	0.003 U	0.0030	0.026	1.0
	27-Mar-07	--	0.003 U	0.00088 J	0.0061	12
	14-Jul-07	--	0.003 U	0.001 U	0.001 U	7.8
	21-Jan-08	--	0.003 U	0.001 U	0.001 U	12
	14-Mar-09	--	0.002 U	0.001 U	0.0028	19
ML-3-6	22-Aug-06	--	NA	0.005 U	0.30	0.46
	21-Jan-07	--	0.003 U	0.0020	0.0047	9.7
	14-Jul-07	--	0.003 U	0.001 U	0.001 U	7.5
	18-Jul-08	--	0.003 U	0.001 U	0.001 U	7.8
	14-Mar-09	--	0.002 U	0.001 U	0.0017	12
ML-3-7	27-Jun-06	Duplicate	0.0122 U	0.0019 U	0.0026 U	0.81
	04-Oct-06	--	0.003 U	0.001 U	0.063	0.49
	04-Dec-06	--	0.003 U	0.001 U	0.067	4.7
	22-Jan-07	--	0.003 U	0.001 U	0.032	9.6
	27-Mar-07	--	0.003 U	0.001 U	0.010	8.8
	14-Jul-07	--	0.003 U	0.00085 J	0.030	6.4
	21-Jan-08	--	0.003 U	0.0072	0.0042	12
	14-Mar-09	--	0.002 U	0.075	0.10	13
ML-4-2	22-Aug-06	--	NA	0.02 U	0.48	1.1
	22-Jan-07	--	0.003 U	0.39	6.7	0.83
	14-Jul-07	--	0.003 U	0.37	9.5	2.3
	21-Jan-08	--	0.003 U	0.12 J	17	11
	11-Mar-09	--	0.002 U	0.016	2.1	18
ML-4-3	04-Oct-06	--	0.003 U	0.001 U	1.0	1.8
	29-Nov-06	--	0.003 U	0.001 U	0.70	0.83
	22-Mar-07	--	0.003 U	0.027	2.0	2.3
	22-Jan-08	--	0.003 U	0.1 U	4.2	6.0
	21-Jul-08	--	0.003 U	0.098	3.2	11
	11-Mar-09	--	0.002 U	0.043	2.9	17
ML-4-4	24-Aug-06	--	NA	0.02 U	0.50	0.99
	23-Jan-07	--	0.003 U	0.0020	0.65	0.99
	16-Jul-07	--	0.003 U	0.0047	1.4	4.4
	12-Mar-09	--	0.002 U	0.032	0.34	14
ML-4-5	04-Oct-06	--	0.003 U	0.001 U	0.049	0.21
	29-Nov-06	--	0.003 U	0.0013	0.045	0.49
	23-Mar-07	--	0.003 U	0.0062	0.43	3.2
	16-Jul-07	--	0.003 U	0.0043	1.4	5.4
	16-Jul-07	Duplicate	0.003 U	0.0051	1.4	5.2
	22-Jan-08	--	0.003 U	0.0020	0.78	9.1
	21-Jul-08	--	0.003 U	0.12 J	0.61	16
	12-Mar-09	--	0.002 U	0.064	0.36	18
ML-4-6	24-Aug-06	--	NA	0.005 U	0.034	0.40
	23-Jan-07	--	0.003 U	0.0011	0.13	1.2
	16-Jul-07	--	0.003 U	0.0017	1.2	10
	22-Jan-08	--	0.003 U	0.016	0.89	13
	12-Mar-09	--	0.002 U	0.061	0.40	20

TABLE E-32: GROUNDWATER DHG CONCENTRATION DATA
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	Acetylene (mg/L)	Ethane (mg/L)	Ethene (mg/L)	Methane (mg/L)
ML-4-7	28-Jun-06	--	NA	0.00035 U	0.0019	0.69
	04-Oct-06	--	0.003 U	0.001 U	0.0095	1.4
	30-Nov-06	--	0.003 U	0.001 U	0.097	1.6
	23-Mar-07	--	0.003 U	0.001 U	0.54	2.5
	16-Jul-07	--	0.003 U	0.001 U	1.5	4.8
	22-Jan-08	--	0.003 U	0.013	0.66	11
	12-Mar-09	--	0.002 U	0.27	0.13 J	19
ML-5-2	23-Aug-06	--	NA	0.005 U	0.058	0.48
	23-Jan-07	--	0.003 U	0.092	1.8	0.40
	16-Jul-07	--	0.003 U	0.045	14	0.48 J
	22-Jan-08	--	0.003 U	0.26 J	25	2.6
	22-Jul-08	--	0.003 U	0.16 J	18	2.6
	06-Mar-09	--	0.002 U	0.43 E	16	3.2
ML-5-3	23-Aug-06	--	NA	0.02 U	0.69	1.2
	05-Oct-06	--	0.003 U	0.015	0.31	1.2
	29-Nov-06	--	0.003 U	0.030	0.47	0.90
	23-Mar-07	--	0.003 U	0.091	1.6	0.88
	22-Jan-08	--	0.003 U	0.21	8.7	1.7
	18-Jul-08	--	0.003 U	0.24 J	13	2.7
	06-Mar-09	--	0.002 U	0.52	29	5.6
	06-Mar-09	Duplicate	0.002 U	0.36	20	3.7
ML-5-4	23-Aug-06	--	NA	0.005 U	0.055	0.36
	23-Jan-07	--	0.003 U	0.072	0.28	5.3
	23-Jan-07	Duplicate	0.003 U	0.068	0.26	3.9
	16-Jul-07	--	0.003 U	0.081	0.59	2.6
	18-Jul-08	--	0.003 U	0.043	0.40	1.7
	07-Mar-09	--	0.002 U	0.16	0.98	7.2
ML-5-5	23-Aug-06	--	NA	0.002 U	0.014	0.15
	05-Oct-06	--	0.003 U	0.00053 J	0.027	0.29
	29-Nov-06	--	0.003 U	0.010	0.053	0.34
	29-Nov-06	Duplicate	0.003 U	0.010	0.055	0.30
	23-Mar-07	--	0.003 U	0.11	0.55	2.2
	16-Jul-07	--	0.003 U	0.11	1.2	1.8
	22-Jan-08	--	0.003 U	0.54	1.8	7.2
	18-Jul-08	--	0.003 U	0.043	0.44	1.2
	07-Mar-09	--	0.002 U	0.26	2.0	11
ML-5-6	23-Aug-06	--	NA	0.005 U	0.0078	0.26
	24-Aug-06	Duplicate	NA	0.005 U	0.0075	0.24
	23-Jan-07	--	0.003 U	0.050	0.80	3.3
	16-Jul-07	--	0.003 U	0.045	2.6	1.4
	23-Jan-08	--	0.003 U	0.39	5.0	5.9
	18-Jul-08	--	0.003 U	0.13 J	5.0	11
	07-Mar-09	--	0.002 U	0.15 J	4.4	10
ML-5-7	23-Aug-06	--	NA	0.01 U	0.01 U	0.69
	29-Nov-06	--	0.003 U	0.0072	0.047	0.56
	23-Mar-07	--	0.003 U	0.089	1.3	1.7
	16-Jul-07	--	0.003 U	0.0083	3.5	1.5
	23-Jan-08	--	0.003 U	0.080 J	2.8	6.9
	18-Jul-08	--	0.003 U	0.089	2.3	7.2
	07-Mar-09	--	0.002 U	0.057	4.0	11
ML-6-2	24-Aug-06	--	NA	0.0058	0.018	0.14
	23-Jan-07	--	0.003 U	0.050	0.66	0.34
	17-Jul-07	--	0.003 U	0.022	12	0.43
	23-Jul-08	--	0.003 U	0.32	14	1.5
	10-Mar-09	--	0.002 U	1.0	34	5.3
ML-6-3	28-Jun-06	--	NA	0.012	0.24	1.3
	05-Oct-06	--	0.003 U	0.00087 J	0.016	0.086
	29-Nov-06	--	0.003 U	0.0058	0.041	0.41
	27-Mar-07	--	0.003 U	0.024	0.50	0.36
	23-Jan-08	--	0.003 U	0.48	13	1.7
	19-Jul-08	--	0.003 U	0.51	5.1	2.2
	10-Mar-09	--	0.002 U	0.74	23	4.0
ML-6-4	24-Aug-06	--	NA	0.002 U	0.016	0.18
	24-Jan-07	--	0.003 U	0.14	0.32	0.13
	17-Jul-07	--	0.003 U	0.96	4.2	0.76
	23-Jan-08	--	0.003 U	1.0	4.4	1.4
	23-Jan-08	Duplicate	0.003 U	1.0	4.5	1.3
	19-Jul-08	--	0.003 U	0.64	2.2	5.8
	11-Mar-09	--	0.002 U	0.32	1.6	6.0

TABLE E-32: GROUNDWATER DHG CONCENTRATION DATA
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	Acetylene (mg/L)	Ethane (mg/L)	Ethene (mg/L)	Methane (mg/L)
ML-6-5	05-Oct-06	--	0.003 U	0.001 U	0.0012	0.085
	05-Oct-06	Duplicate	0.003 U	0.001 U	0.0017	0.082
	29-Nov-06	--	0.033 J	0.012	0.036	0.086
	26-Mar-07	Duplicate	0.012	0.46	1.6	0.14
	27-Mar-07	--	0.015	0.50	1.8	0.15
	17-Jul-07	--	0.0082	1.8	6.8	0.52
	23-Jan-08	--	0.018	2.0	8.2	0.62
	19-Jul-08	--	0.003 U	1.4	5.0	2.9
	11-Mar-09	--	0.002 U	2.0	7.4	4.9
ML-6-6	24-Aug-06	--	NA	0.005 U	0.005 U	0.25
	24-Jan-07	--	0.003 U	0.063	0.25	0.17
	17-Jul-07	--	0.0047	1.0	4.4	0.41
	23-Jan-08	--	0.012	1.2	7.0	0.58
	19-Jul-08	--	0.003 U	1.3	7.1	2.3
	11-Mar-09	--	0.002 U	1.3	8.9	3.6
ML-6-7	28-Jun-06	--	NA	0.00035 U	0.00036	0.34
	05-Oct-06	--	0.003 U	0.001 U	0.00075 J	0.98
	29-Nov-06	--	0.003 U	0.001 U	0.0046	0.70
	28-Mar-07	--	0.0020 J	0.13	0.95	0.40
	17-Jul-07	--	0.003 U	0.19	3.3	0.70
	23-Jan-08	--	0.003 U	0.40	4.8	0.67
	19-Jul-08	--	0.003 U	0.40	6.3	1.0
	11-Mar-09	--	0.002 U	0.50	9.9	2.0
ML-7-2	23-Aug-06	--	NA	0.005 U	0.088	0.36
	24-Jan-07	--	0.003 U	0.054	4.8	0.20
	17-Jul-07	--	0.003 U	0.42	3.4	1.1
	23-Jul-08	--	0.003 U	1.1	5.4	4.1
	09-Mar-09	--	0.002 U	0.87	6.8	15
ML-7-3	29-Jun-06	--	NA	0.0033	0.11	1.8
	23-Aug-06	--	NA	0.01 U	0.047	0.64
	05-Oct-06	--	0.003 U	0.0015	0.075	0.83
	02-Dec-06	--	0.003 U	0.045	0.68	0.29
	24-Jan-07	--	0.003 U	0.16	2.5	0.34
	28-Mar-07	--	0.003 U	0.41	4.7	0.46
	23-Jan-08	--	0.003 U	1.2	6.9	2.2
	09-Mar-09	--	0.002 U	2.0	12	11
ML-7-4	23-Aug-06	--	NA	0.005 U	0.011	0.24
	24-Jan-07	--	0.003 U	0.084	2.0	1.6
	18-Jul-07	--	0.003 U	0.52	4.6	2.2
	23-Jan-08	--	0.003 U	1.4	5.4	4.3
	19-Jul-08	--	0.003 U	1.2	4.7	4.1
	10-Mar-09	--	0.002 U	1.9	6.0	11
ML-7-5	23-Aug-06	--	NA	0.0016	0.0045	0.085
	05-Oct-06	--	0.003 U	0.001 U	0.00088 J	0.054
	04-Dec-06	--	0.003 U	0.010	0.045	0.041
	25-Jan-07	--	0.003 U	0.094	0.74	0.97
	28-Mar-07	--	0.003 U	0.12	0.58	1.4
	18-Jul-07	--	0.003 U	0.88	2.3	2.6
	24-Jan-08	--	0.003 U	1.3	3.4	3.3
	10-Mar-09	--	0.0033	3.3	8.1	12
ML-7-6	24-Aug-06	--	NA	0.002 U	0.0027	0.13
	25-Jan-07	--	0.003 U	0.018	5.0	0.54
	18-Jul-07	--	0.003 U	0.45	4.9	1.7
	24-Jan-08	--	0.003 U	1.1	5.8	4.4
	19-Jul-08	--	0.003 U	0.86	6.8	13
	10-Mar-09	--	0.002 U	0.58	7.3	18
ML-7-7	24-Aug-06	--	NA	0.005 U	0.005 U	0.44
	04-Dec-06	--	0.003 U	0.0095	0.088	0.28
	25-Jan-07	--	0.003 U	0.014	4.0	0.45
	29-Mar-07	--	0.003 U	0.087	2.3	0.81
	18-Jul-07	--	0.003 U	0.26	5.1	1.4
	24-Jan-08	--	0.003 U	0.66	5.4	4.3
	10-Mar-09	--	0.002 U	0.031	1.3	15
PMW-1	04-Oct-06	--	0.003 U	0.001 U	0.049	0.42
	30-Nov-06	--	0.003 U	0.0056	0.20	1.6
	19-Jan-07	--	0.003 U	0.023	0.31	3.0
	26-Mar-07	--	0.003 U	0.017	0.27	3.2
	11-Jul-07	--	0.003 U	0.022	1.5	5.4
	16-Jan-08	--	0.003 U	0.0021	0.67	6.8
	16-Jul-08	--	0.003 U	0.001 U	0.56	8.2
	04-Mar-09	--	0.002 U	0.0033	0.41	9.2
	04-Mar-09	Duplicate	0.002 U	0.0039	0.43	8.6

TABLE E-32: GROUNDWATER DHG CONCENTRATION DATA
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	Acetylene (mg/L)	Ethane (mg/L)	Ethene (mg/L)	Methane (mg/L)
PMW-2	04-Oct-06	--	0.003 U	0.001 U	0.18	0.65
	30-Nov-06	--	0.003 U	0.001 U	0.24	0.77
	26-Mar-07	--	0.003 U	0.001 U	0.27	0.69
	11-Jul-07	--	0.003 U	0.00070 J	0.14	1.2
	16-Jan-08	--	0.003 U	0.00044 J	0.33	2.8
	16-Jul-08	--	0.003 U	0.0029	0.089	3.6
	04-Mar-09	--	0.002 U	0.0026	0.19	4.1
PMW-3	21-Aug-06	--	NA	0.005 U	0.14	0.48
	10-Oct-06	--	0.003 U	0.0014	0.11	0.44
	10-Oct-06	Duplicate	0.003 U	0.0015	0.11	0.44
	12-Oct-06	--	0.003 U	0.001 U	0.078	0.28
	29-Nov-06	--	0.003 U	0.0030	0.023	0.13
	19-Jan-07	--	0.003 U	0.031	0.12	2.1
	21-Mar-07	--	0.003 U	0.11	0.37	2.6
	11-Jul-07	--	0.003 U	0.057	0.26	1.0
	11-Jul-07	Duplicate	0.003 U	0.057	0.33	1.3
	16-Jan-08	--	0.003 U	0.55	1.9	6.7
	16-Jan-08	Duplicate	0.003 U	0.52	1.8	6.4
	16-Jul-08	--	0.003 U	0.084	0.77	9.0
	16-Jul-08	Duplicate	0.003 U	0.090	0.54	6.4
	04-Mar-09	--	0.002 U	0.11	1.3	5.0
PMW-4	04-Oct-06	--	0.003 U	0.001 U	0.001 U	0.026
	01-Dec-06	--	0.003 U	0.0012	0.0012	0.26
	21-Mar-07	--	0.003 U	0.0016	0.0028	0.33
	12-Jul-07	--	0.003 U	0.00093 J	0.0017	0.20
	17-Jan-08	--	0.003 U	0.0027	0.0069	0.38
	16-Jul-08	--	0.003 U	0.0022	0.0091	0.18
	05-Mar-09	--	0.002 U	0.0059	0.021	0.35
PMW-5	27-Jun-06	--	NA	0.0024	0.0096	0.15
	21-Aug-06	--	NA	0.0023	0.0062	0.12
	21-Aug-06	Duplicate	NA	0.0021	0.0057	0.10
	05-Oct-06	--	0.003 U	0.0024	0.0056	0.12
	02-Dec-06	--	0.11 J	0.14	0.54	0.056
	02-Dec-06	Duplicate	0.10 J	0.15	0.55	0.053
	19-Jan-07	--	0.049	0.29	1.1	0.23
	21-Mar-07	--	0.039	0.65	2.3	0.43
	21-Mar-07	Duplicate	0.031	0.58	2.0	0.40
	12-Jul-07	--	0.035	1.1	3.8	0.39
	17-Jan-08	--	0.044	2.0	7.2	1.3
	16-Jul-08	--	0.098	1.3	4.0	1.3
	05-Mar-09	--	0.014	0.83	3.1	1.6
	05-Mar-09	Duplicate	0.017	0.82	2.8	1.5
PMW-6	26-Jun-06	--	NA	0.00035 U	0.37	0.87
	21-Aug-06	--	NA	0.005 U	0.35	0.47
	04-Oct-06	--	0.003 U	0.001 U	0.10	0.23
	02-Dec-06	--	0.003 U	0.010	0.067	0.19
	19-Jan-07	--	0.003 U	0.021	0.23	0.37
	19-Jan-07	Duplicate	0.003 U	0.020	0.22	0.34
	21-Mar-07	--	0.003 U	0.026	0.53	0.95
	12-Jul-07	--	0.003 U	0.034	0.51	3.0
	17-Jan-08	--	0.003 U	0.0052	0.51	5.3
	17-Jan-08	Duplicate	0.003 U	0.0047	0.61	5.9
	16-Jul-08	--	0.003 U	0.090	0.075 J	12
	04-Mar-09	--	0.002 U	0.084	0.15	5.3

Notes:

mg/L - milligrams per liter

NA - not analyzed

"J" - estimated result

"U" - not detected (reported at detection limit)

TABLE E-33: GROUNDWATER VFA CONCENTRATION DATA
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	Acetic Acid (mg/L)	Butyric Acid (mg/L)	Lactic Acid (mg/L)	Propionic Acid (mg/L)	Pyruvic Acid (mg/L)
ML-1-3	27-Jun-06	--	0.50 U	0.50 U	10 U	0.50 U	NA
	30-Nov-06	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	24-Mar-07	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	18-Jan-08	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	7-Mar-09	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
ML-1-5	27-Jun-06	--	0.50 U	0.50 U	10 U	0.50 U	NA
	30-Nov-06	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	24-Mar-07	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	18-Jan-08	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	9-Mar-09	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
ML-1-7	27-Jun-06	--	1.4	0.50 U	10 U	0.50 U	NA
	30-Nov-06	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	24-Mar-07	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	18-Jan-08	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	9-Mar-09	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
ML-2-3	27-Jun-06	--	0.87	0.50 U	10 U	0.50 U	NA
	1-Dec-06	--	490	47	1.0 U	580	0.50 U
	21-Mar-07	--	630	230	10 U	760	5.0 U
	18-Jan-08	--	290	190	1.0 U	460	0.50 U
	5-Mar-09	--	76	11	1.0 U	69	0.50 U
ML-2-5	27-Jun-06	--	0.50 U	0.50 U	10 U	0.50 U	NA
	1-Dec-06	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	22-Mar-07	--	1.0 U	2.0 U	1.0 U	2.5	0.50 U
	20-Jan-08	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	6-Mar-09	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
ML-2-7	27-Jun-06	--	0.50 U	0.50 U	10 U	0.50 U	NA
	2-Dec-06	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	22-Mar-07	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	20-Jan-08	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	6-Mar-09	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
ML-3-3	27-Jun-06	--	0.78	0.50 U	10 U	0.50 U	NA
	21-Jan-07	--	1,100	220	1.0 U	1,400	0.50 U
	26-Mar-07	--	1,000	420	20 U	1,700	10 U
	20-Jan-08	--	1,300	370	1.0 U	1,500	1.0
	13-Mar-09	--	660	100	1.0 U	770	0.50 U
ML-3-5	27-Jun-06	--	0.50 U	0.50 U	10 U	0.50 U	NA
	4-Dec-06	--	250	62	1.0 U	450	0.50 U
	27-Mar-07	--	190	110	10 U	1,000	5.0 U
	21-Jan-08	--	140	30	1.0 U	710	0.50 U
	14-Mar-09	--	150	16	1.0 U	31	0.50 U
ML-3-7	27-Jun-06	--	4.9	1.3	10 U	0.50 U	NA
	22-Jan-07	--	370	110	1.0 U	460	0.50 U
	27-Mar-07	--	53	33	2.0 U	220	1.0 U
	21-Jan-08	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	14-Mar-09	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
ML-4-3	28-Jun-06	--	0.50	0.50 U	10 U	0.50 U	NA
	29-Nov-06	--	6.4	2.0 U	1.0 U	3.0	0.50 U
	22-Mar-07	--	45	2.0 U	1.0 U	15	0.50 U
	22-Jan-08	--	110	7.4	1.0 U	15	0.50 U
	11-Mar-09	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
ML-4-5	28-Jun-06	--	0.57	0.50 U	10 U	0.50 U	NA
	29-Nov-06	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	23-Mar-07	--	47	2.0 U	1.0 U	5.6	0.50 U
	22-Jan-08	--	10	2.0 U	1.0 U	1.2	0.50 U
	12-Mar-09	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
ML-4-7	28-Jun-06	--	0.85	0.50 U	10 U	0.50 U	NA
	30-Nov-06	--	25	2.0 U	1.0 U	5.7	0.50 U
	23-Mar-07	--	55	3.7	1.0 U	5.2	0.50 U
	22-Jan-08	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	12-Mar-09	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U

TABLE E-33: GROUNDWATER VFA CONCENTRATION DATA
Parris Island, South Carolina

Geosyntec Consultants

Location	Date Sampled	Duplicate	Acetic Acid (mg/L)	Butyric Acid (mg/L)	Lactic Acid (mg/L)	Propionic Acid (mg/L)	Pyruvic Acid (mg/L)
ML-5-3	28-Jun-06	--	0.74	0.50 U	10 U	0.50 U	NA
	29-Nov-06	--	10	2.0 U	1.0 U	11	0.50 U
	23-Mar-07	--	44	8.6	1.0 U	30	0.50 U
	22-Jan-08	--	120	6.0	1.0 U	16	0.50 U
	22-Jan-08	Duplicate	76	2.0 U	1.0 U	3.4	0.50 U
	6-Mar-09	--	170	5.1	1.0 U	24	0.50 U
	6-Mar-09	Duplicate	170	6.1	1.0 U	24	0.50 U
ML-5-5	28-Jun-06	--	0.50 U	0.50 U	10 U	0.50 U	NA
	29-Nov-06	--	65	6.2	1.0 U	110	0.50 U
	29-Nov-06	Duplicate	66	8.2	1.0 U	110	0.50 U
	23-Mar-07	--	86	23	10 U	210	5.0 U
	22-Jan-08	--	160	56	1.0 U	140	0.50 U
	7-Mar-09	--	33	4.4	1.0 U	14	0.50 U
ML-5-7	28-Jun-06	--	1.0	0.50 U	10 U	0.50 U	NA
	29-Nov-06	--	46	3.9	1.0 U	74	0.50 U
	23-Mar-07	--	80	17	5.0 U	180	2.5 U
	23-Jan-08	--	39	5.9	1.0 U	53	0.50 U
	7-Mar-09	--	1.0 U	2.0 U	1.0 U	1.1	0.50 U
ML-6-3	28-Jun-06	--	0.50 U	0.50 U	10 U	0.50 U	NA
	29-Nov-06	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U
	27-Mar-07	--	5.8	3.7	1.0 U	4.5	0.50 U
	23-Jan-08	--	69	2.0 U	1.0 U	11	0.50 U
	10-Mar-09	--	220	24	1.0 U	100	0.50 U
ML-6-5	28-Jun-06	--	0.50 U	0.50 U	10 U	0.50 U	NA
	29-Nov-06	--	20	2.9	1.0 U	28	0.50 U
	26-Mar-07	Duplicate	62	6.2	1.0 U	78	0.50 U
	27-Mar-07	--	62	6.3	1.0 U	79	0.50 U
	23-Jan-08	--	150	46	1.0 U	110	0.50 U
	11-Mar-09	--	110	20	1.0 U	97	0.50 U
ML-6-7	28-Jun-06	--	0.65	0.50 U	10 U	0.50 U	NA
	29-Nov-06	--	10	2.0 U	1.0 U	14	0.50 U
	28-Mar-07	--	41	3.9	1.0 U	40	0.50 U
	23-Jan-08	--	57	5.6	1.0 U	18	0.50 U
	11-Mar-09	--	71	4.9	1.0 U	36	0.50 U
ML-7-2	29-Jun-06	--	0.99	0.50 U	10 U	0.50 U	NA
ML-7-3	29-Jun-06	--	1.3	0.50 U	10 U	0.50 U	NA
	24-Jan-07	--	190	2.0 U	1.0 U	170	0.50 U
	28-Mar-07	--	310	22	5.0 U	370	2.5 U
	23-Jan-08	--	830	180	1.0 U	510	0.50 U
	9-Mar-09	--	760	220	1.0 U	530	0.50 U
ML-7-5	29-Jun-06	--	0.50 U	0.50 U	10 U	0.50 U	NA
	4-Dec-06	--	68	2.0 U	1.0 U	130	0.50 U
	28-Mar-07	--	100	20	5.0 U	210	2.5 U
	24-Jan-08	--	180	97	1.0 U	190	0.50 U
	10-Mar-09	--	180	60	1.0 U	170	0.50 U
ML-7-7	29-Jun-06	--	0.50 U	0.50 U	10 U	0.50 U	NA
	25-Jan-07	--	89	9.1	1.0 U	130	0.50 U
	25-Jan-07	Duplicate	94	11	1.0 U	140	0.50 U
	29-Mar-07	--	100	12	1.0 U	160	0.50 U
	24-Jan-08	--	170	61	1.0 U	160	0.50 U
	10-Mar-09	--	56	13	1.0 U	100	0.50 U
PMW-5	27-Jun-06	--	0.50 U	0.50 U	10 U	0.50 U	NA
	2-Dec-06	--	48	3.1	1.0 U	71	0.50 U
	21-Mar-07	--	100	33	10 U	160	5.0 U
	21-Mar-07	Duplicate	100	36	1.0 U	160	0.50 U
	17-Jan-08	--	230	100	1.0 U	180	0.50 U
	5-Mar-09	--	110	30	1.0 U	71	0.50 U
	5-Mar-09	Duplicate	110	30	1.0 U	72	0.50 U
PMW-6	26-Jun-06	--	0.50 U	0.50 U	10 U	0.50 U	NA
	2-Dec-06	--	61	2.5	1.0 U	9.9	0.50 U
	21-Mar-07	--	49	4.4	1.0 U	13	0.50 U
	17-Jan-08	--	12	2.0 U	1.0 U	1.4	0.50 U
	17-Jan-08	Duplicate	12	2.0 U	1.0 U	1.4	0.50 U
	4-Mar-09	--	1.0 U	2.0 U	1.0 U	1.0 U	0.50 U

Notes:
mg/L - milligrams per liter
NA - not analyzed
"U" - not detected (reported at detection limit)

TABLE E-34: CALCULATION OF PRE-INJECTION MASS FLUX ESTIMATES FOR PNEUMATIC INJECTION TEST PLOT - 5 WELLS
Parris Island, South Carolina

Geosyntec Consultants

Water level (assumed) 3.4 ft bgs

Soil Type	Porosity ^a (ft)	K ^b (ft/d)	Gradient ^c ft/ft
sand	0.281	0.283464567	0.0026
clay	0.625	0.000283465	0.0026
peat	0.844	0.141732283	0.0026

a - porosity estimates from SC-9 results
b - assumed from literature search
c - gradient from RI (median of Nov 2001 gradients)

	Well ID	Screen Midpoint (ft)	Width (ft)	Depth Interval		Thickness (ft)	Soil Type from	Weighted Porosity	Effective Area (ft ²)	Weighted K (ft/d)	GW Velocity (ft/d)	Pre-Injection VOC & DHG Concentrations (µg/L)						Total	Pre-Injection VOC & DHG Flux (g/d)						Pre-Injection VOC & DHG Flux (mmol/d)										
				Top (ft)	Bottom (ft)							PCE TCE	cDCE tDCE	1,1-DCE	VC	Ethene	PCE TCE		cDCE tDCE	1,1-DCE	VC	Ethene	PCE TCE	cDCE tDCE	1,1-DCE	VC	Ethene								
Upgradient wells	ML-1-2	6.50	7.50	3.40	7.75	4.35	sand and clay	SC-9	0.350	11.43	0.23	0.00	Oct-06	50	50	23,000	810	50	9,900	1400	0.00	0.00	0.01	0.00	0.00	0.01	0.00	1.64E-04	2.07E-04	1.29E-01	4.55E-03	2.81E-04	8.62E-02	2.67E-02	
	ML-1-3	9.00	7.50	7.75	10.25	2.50	clay and sand	SC-9	0.625	11.72	0.00	0.00	Oct-06	50	78	3,400	410	50	6,700	820	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18E-07	2.32E-07	1.37E-05	1.66E-06	2.02E-07	4.19E-05	1.13E-05	
	ML-1-4	11.50	7.50	10.25	12.75	2.50	clay and sand	SC-9	0.522	9.78	0.09	0.00	Aug-06	50	10	4,300	140	10	870	220	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.55E-05	8.96E-06	5.22E-03	1.70E-04	1.21E-05	1.64E-03	9.08E-04	
	ML-1-5	14.00	7.50	12.75	15.25	2.50	sand	SC-9	0.281	5.27	0.28	0.00	Oct-06	11	1	14	18	1	120	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.66E-05	2.98E-06	5.85E-05	7.77E-05	4.04E-06	7.51E-04	4.67E-05	
	ML-1-6	16.50	7.50	15.25	17.75	2.50	sand	SC-9	0.281	5.27	0.28	0.00	Aug-06	3	3	440	15	3	65	7.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.90E-06	8.34E-06	1.78E-03	6.05E-05	1.01E-05	4.07E-04	1.08E-04	
	ML-1-7	19.00	7.50	17.75	20.00	2.25	sand and peat	SC-9	0.781	13.19	0.16	0.00	Oct-06	10	1	100	4	1	43	2.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18E-05	1.49E-06	2.02E-04	8.07E-06	2.02E-06	1.35E-04	1.99E-05	
	ML-2-2	6.00	7.50	3.40	7.25	3.85	sand	SC-7	0.281	8.11	0.28	0.00	Aug-06	6,500	9,900	160,000	850	500	1,200	170	0.00	0.01	0.10	0.00	0.00	0.00	0.00	2.50E-02	4.49E-02	9.95E-01	5.28E-03	3.11E-03	1.14E-02	3.59E-03	
	ML-2-3	8.50	7.50	7.25	9.75	2.50	sand and clay	SC-7	0.522	9.78	0.09	0.00	Oct-06	7,300	11,000	92,000	500	500	500	210	0.00	0.00	0.01	0.00	0.00	0.00	0.00	5.18E-03	9.85E-03	1.12E-01	6.07E-04	6.07E-04	9.41E-04	8.67E-04	
	ML-2-4	11.00	7.50	9.75	12.25	2.50	clay and sand	SC-7	0.591	11.07	0.03	0.00	Aug-06	49,000	36,000	23,000	320	250	460	110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17E-02	1.08E-02	9.37E-03	1.30E-04	1.02E-04	2.91E-04	1.52E-04	
	ML-2-5	13.50	7.50	12.25	14.75	2.50	sand	SC-7	0.281	5.27	0.28	0.00	Oct-06	180,000	4,700	3,100	500	500	500	2.3	0.07	0.00	0.00	0.00	0.00	0.00	0.00	4.25E-01	1.40E-02	1.25E-02	2.02E-03	2.02E-03	3.13E-03	3.16E-05	
	ML-2-6	16.00	7.50	14.75	17.25	2.50	sand	SC-7	0.281	5.27	0.28	0.00	Aug-06	46,000	21,000	5,200	500	500	500	4.2	0.02	0.01	0.00	0.00	0.00	0.00	0.00	1.09E-01	6.25E-02	2.10E-02	2.02E-03	2.02E-03	3.13E-03	5.77E-05	
	ML-2-7	18.50	7.50	17.25	20.00	2.75	sand and peat	SC-7	0.690	14.24	0.18	0.00	Oct-06	82,000	12,000	38,000	500	500	500	3.3	0.02	0.00	0.01	0.00	0.00	0.00	0.00	1.35E-01	2.50E-02	1.07E-01	1.41E-03	1.41E-03	2.19E-03	3.17E-05	
											Total	0.12	0.02	0.14	0.00	0.00	0.01	0.00	0.71	0.17	1.39	0.02	0.01	0.11	0.04										
Downgradient wells	ML-3-2	6.50	3.02	3.40	7.75	4.35	sand	SC-3	0.281	3.69	0.28	0.00	Aug-06	50	50	4,800	500	50	12,000	2,200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.05	0.02	
	ML-3-3	9.00	3.02	7.75	10.25	2.50	sand and clay	SC-3	0.556	4.20	0.06	0.00	Aug-06	50	50	4,800	650	50	9,600	2,700	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ML-3-4	11.50	3.02	10.25	12.75	2.50	sand	SC-3	0.281	2.12	0.00	0.00	Aug-06	10	10	1,100	110	10	1,800	490	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ML-3-5	14.00	3.02	12.75	15.25	2.50	sand	SC-3	0.281	2.12	0.28	0.00	Aug-06	2	3	330	26	2	330	96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ML-3-6	16.50	3.02	15.25	17.75	2.50	sand	SC-3	0.281	2.12	0.28	0.00	Aug-06	5	5	450	46	5	910	300	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ML-3-7	19.00	3.02	17.75	20.00	2.25	sand and peat	SC-3	0.781	5.31	0.16	0.00	Oct-06	13	2	130	18	2	230	63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ML-4-2	6.50	3.22	3.40	7.75	4.35	sand	SC-3	0.281	3.94	0.28	0.00	Aug-06	200	200	58,000	1,500	200	9,200	480	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.04	0.00	
	ML-4-3	9.00	3.22	7.75	10.25	2.50	sand and clay	SC-3	0.556	4.48	0.06	0.00	Oct-06	100	1,400	49,000	2,000	100	7,200	1,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	
	ML-4-4	11.50	3.22	10.25	12.75	2.50	sand	SC-3	0.281	2.26	0.00	0.00	Aug-06	200	200	31,000	910	200	3,700	500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	ML-4-5	14.00	3.22	12.75	15.25	2.50	sand	SC-3	0.281	2.26	0.28	0.00	Oct-06	2,800	3,100	8,800	140	25	1,200	49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	
	ML-4-6	16.50	3.22	15.25	17.75	2.50	sand	SC-3	0.281	2.26	0.28	0.00	Aug-06	50	50	5,100	64	50	280	34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	
	ML-4-7	19.00	3.22	17.75	20.00	2.25	sand and peat	SC-3	0.781	5.66	0.16	0.00	Oct-06	7	5	990	19	5	200	9.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	ML-5-2	6.50	2.71	3.40	7.75	4.35	sand	SC-3	0.281	3.31	0.28	0.00	Aug-06	380	250	100,000	1,700	250	1,300	58	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.01	0.00	
	ML-5-3	9.00	2.71	7.75	10.25	2.50	sand and clay	SC-3	0.556	3.77	0.06	0.00	Aug-06	1,300	500	136,000	4,100	500	5,700	690	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	
	ML-5-4	11.50	2.71	10.25	12.75	2.50	sand	SC-3	0.281	1.90	0.00	0.00	Aug-06	340	960	31,000	440	200	400	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	ML-5-5	14.00	2.71	12.75	15.25	2.50	sand	SC-3	0.281	1.90	0.28	0.00	Aug-06	140	350	34,000	270	100	160	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	
	ML-5-6	16.50	2.71	15.25	17.75	2.50	sand	SC-3	0.281	1.90	0.28	0.00	Aug-06	50	50	11,000	120	50	110	7.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	
	ML-5-7	19.00	2.71	17.75	20.00	2.25	sand and peat	SC-3	0.781	4.76	0.16	0.00	Aug-06	10	10	1,800	28	10	30	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	ML-6-2	6.50	2.90	3.40	7.75	4.35	sand	SC-8	0.281	3.54	0.28	0.00	Aug-06	500	500	90,000	1,300	500	760	18	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	
	ML-6-3	9.00	2.90	7.75	10.25	2.50	sand and clay	SC-8	0.591	4.28	0.03	0.00	Oct-06	3,500	10,000	71,000	2,200	250	1,900	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	
	ML-6-4	11.50	2.90	10.25	12.75	2.50	sand and clay	SC-8	0.522	3.78	0.09	0.00	Aug-06	210	2,200	26,000	260	200	200	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	
	ML-6-5	14.00	2.90	12.75	15.25	2.50	sand	SC-8	0.281	2.04	0.28	0.00	Oct-06	39,000	6,900	15,000	250	250	250	12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ML-6-6	16.50	2.90	15.25	17.75	2.50	sand	SC-8	0.281	2.04	0.28	0.00	Aug-06	100	200	12,000	110	100	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00		
ML-6-7	19.00	2.90	17.75	20.00	2.25	sand and peat	SC-8	0.781	5.10	0.16	0.00	Oct-06	10	10	2,200	41	10	68	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
ML-7-2	6.00	3.13	3.40	7.25	3.85	sand	SC-8	0.281	3.39	0.28	0.00	Aug-06	250	250	73,000	1,800	250	8,700	88	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00</							

Water level (assumed)	3.4 ft bgs
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	Well ID	Screen Midpoint (ft)	Width (ft)
Upradient wells	ML-1-2	6.50	7.50
	ML-1-3	9.00	7.50
	ML-1-4	11.50	7.50
	ML-1-5	14.00	7.50
	ML-1-6	16.50	7.50
	ML-1-7	19.00	7.50
	ML-2-2	6.00	7.50
	ML-2-3	8.50	7.50
	ML-2-4	11.00	7.50
	ML-2-5	13.50	7.50
Downgradient wells	ML-2-6	16.00	7.50
	ML-2-7	18.50	7.50
	ML-3-2	6.50	3.02
	ML-3-3	9.00	3.02
	ML-3-4	11.50	3.02
	ML-3-5	14.00	3.02
	ML-3-6	16.50	3.02
	ML-3-7	19.00	3.02
	ML-4-2	6.50	3.22
	ML-4-3	9.00	3.22
	ML-4-4	11.50	3.22
	ML-4-5	14.00	3.22
	ML-4-6	16.50	3.22
	ML-4-7	19.00	3.22
	ML-5-2	6.50	2.71
	ML-5-3	9.00	2.71
	ML-5-4	11.50	2.71
	ML-5-5	14.00	2.71
	ML-5-6	16.50	2.71
	ML-5-7	19.00	2.71
	ML-6-2	6.50	2.90
	ML-6-3	9.00	2.90
	ML-6-4	11.50	2.90
	ML-6-5	14.00	2.90
	ML-6-6	16.50	2.90
	ML-6-7	19.00	2.90
	ML-7-2	6.00	3.13
	ML-7-3	8.50	3.13
	ML-7-4	11.00	3.13
	ML-7-5	13.50	3.13
	ML-7-6	16.00	3.13
	ML-7-7	18.50	3.13

Notes:
ft bps - feet below ground surface
ft - feet
ft/d - feet per day
n² - square foot
µg/L - micrograms per liter
g/d - grams per day
mmd/d - milliliters per day

Bold indicates detected parameter; non-bold is quantitation limit

a - porosity estimates from SC-9 results
b - assumed from literature search
c - gradient from RI (median of Nov 2001 gradients)

Notes:
ft bgs - feet below ground surface
ft - feet
ft/d - feet per day
ft² - square foot
µg/L - micrograms per liter
g/d - grams per day
mmol/day - millimols per day
Bold indicates detected parameter; non-bold is quantitation limit

TABLE E-36: CALCULATION OF POST-INJECTION (MARCH AND JULY 2007) MASS FLUX ESTIMATES FOR PNEUMATIC INJECTION TEST PLOT - 5 WELLS
Parris Island, South Carolina

Geosyntec Consultants

Water level (assumed) 3.4 ft bgs

Soil Type	Porosity ^a	K ^b (ft/d)	Gradient ^c ft/ft
sand	0.281	0.2834646	0.0026
clay	0.625	0.0002835	0.0026
peat	0.844	0.1417322	0.0026

a - porosity estimates from SC-9 results
b - assumed from literature search
c - gradient from RI (median of Nov 2001 gradients)

	Well ID	Screen Midpoint (ft)	Width (ft)	Depth Interval Bottom (ft)	Thickness (ft)	Soil Type from	Weighted Porosity	Effective Area (ft ²)	Weighted K (ft/d)	GW Velocity (ft/d)	Pre-Injection VOC & DHG Concentrations (µg/L)						Post-Injection VOC Flux (g/d)						Post-Injection VOC & DHG Flux (mmol/d)											
											PCE	TCE	cDCE	iDCE	1,1-DCE	VC	Ethene	PCE	TCE	cDCE	iDCE	1,1-DCE	VC	Ethene	PCE	TCE	cDCE	iDCE	1,1-DCE	VC	Ethene			
Upgradient wells	ML-1-2	6.50	3.40	7.75	4.35	sand and clay	SC-9	0.35	11.43	0.23	0.00	Sample Event	Mar-07	200	200	33,000	1,200	200	16,000	1,300	0.00	0.00	0.00	0.00	0.00	0.01	0.00	6.56E-04	8.28E-04	1.85E-01	6.73E-03	1.12E-03	1.39E-01	2.48E-02
	ML-1-3	9.00	7.50	7.75	10.25	2.50	clay	SC-9	0.63	11.72	0.00	0.00	Mar-07	200	200	23,000	1,300	200	16,000	1,200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.72E-07	5.96E-07	9.28E-05	5.25E-06	8.07E-07	1.00E-04	1.65E-05
	ML-1-4	11.50	7.50	10.25	12.75	2.50	clay and sand	SC-9	0.52	9.78	0.09	0.00	Jul-07	20	20	3,200	220	20	2,900	410	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42E-05	1.79E-05	3.88E-03	2.67E-04	2.43E-05	5.46E-03	1.69E-03
	ML-1-5	14.00	7.50	12.75	15.25	2.50	sand	SC-9	0.28	5.27	0.28	0.00	Jul-07	20	20	1,200	110	20	2,000	400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.72E-05	5.96E-05	4.84E-03	4.44E-04	8.07E-05	1.25E-02	5.49E-03
	ML-1-6	16.50	7.50	15.25	17.75	2.50	sand	SC-9	0.28	5.27	0.28	0.00	Jul-07	14	14	27	510	20	7	220	400	0.00	0.00	0.00	0.00	0.00	3.30E-06	8.04E-06	2.06E-03	1.13E-04	8.07E-06	1.38E-03	9.61E-05	
	ML-1-7	19.00	7.50	17.75	20.00	2.25	sand and peat	SC-9	0.78	13.19	0.16	0.00	Jul-07	5	5	980	30	5	340	110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.90E-06	7.45E-06	1.98E-03	6.05E-05	1.01E-05	1.06E-03	7.55E-05
	ML-2-2	6.00	7.50	3.40	7.25	3.85	sand	SC-7	0.28	8.11	0.28	0.00	Jul-07	1,000	1,700	15,000	550	1,000	26,000	5,400	0.00	0.00	0.09	0.00	0.00	0.02	0.00	3.63E-03	7.80E-03	9.32E-01	3.42E-03	6.22E-03	2.51E-01	1.14E-01
	ML-2-3	8.50	7.50	7.25	9.75	2.50	sand and clay	SC-7	0.52	9.78	0.09	0.00	Mar-07	1,000	1,000	140,000	1,000	1,000	11,000	3,400	0.00	0.00	0.02	0.00	0.00	0.00	0.00	7.10E-04	8.96E-04	1.70E-01	1.21E-03	2.07E-02	1.40E-02	
	ML-2-4	11.00	7.50	9.75	12.25	2.50	clay and sand	SC-7	0.59	11.07	0.03	0.00	Mar-07	1,500	1,500	15,000	979	1,500	12,000	4,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10E-04	4.51E-04	4.89E-02	3.95E-04	4.07E-04	2.72E-02	2.08E-03
	ML-2-5	13.50	7.50	12.25	14.75	2.50	sand	SC-7	0.28	5.27	0.28	0.00	Jul-07	150,000	7,700	9,600	1,000	1,000	1,100	33	0.06	0.00	0.00	0.00	0.00	0.00	0.00	3.54E-01	2.29E-02	3.88E-02	4.04E-03	4.04E-03	6.89E-03	4.53E-04
	ML-2-6	16.00	7.50	14.75	17.25	2.50	sand	SC-7	0.28	5.27	0.28	0.00	Jul-07	110,000	6,400	7,900	1,000	1,000	900	41	0.04	0.00	0.00	0.00	0.00	0.00	0.00	2.66E-01	1.91E-02	3.19E-02	4.04E-03	4.04E-03	5.63E-03	5.63E-04
	ML-2-7	18.50	7.50	17.25	20.00	2.75	sand and peat	SC-7	0.69	14.24	0.18	0.00	Jul-07	180,000	5,800	16,000	2,000	2,000	2,000	61	0.05	0.00	0.00	0.00	0.00	0.00	0.00	2.97E-01	1.21E-02	4.52E-02	5.65E-03	8.77E-03	5.86E-04	
											Total						0.15	0.01	0.14	0.00	0.00	0.03	0.00	0.92	0.07	1.47	0.03	0.02	0.48	0.16				
Downgradient wells	ML-3-2	6.50	3.02	3.40	7.75	4.35	sand	SC-3	0.28	3.69	0.28	0.00	Jul-07	11	2.2	87	7.1	1	160	53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82E-05	4.59E-06	2.46E-04	2.01E-05	2.83E-06	7.02E-04	5.10E-04
	ML-3-3	9.00	3.02	7.75	10.25	2.50	sand and clay	SC-3	0.56	4.20	0.06	0.00	Mar-07	1.7	1	23	9.3	1	46	180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.24E-07	2.41E-07	7.51E-06	3.04E-06	3.26E-07	2.33E-05	2.00E-04
	ML-3-4	11.50	3.02	10.25	12.75	2.50	sand	SC-3	0.28	2.12	0.00	0.00	Jul-07	3.3	2.4	58	4	1	39	911	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.14E-09	2.88E-09	9.43E-08	6.99E-09	1.63E-09	1.99E-07	5.03E-08
	ML-3-5	14.00	3.02	12.75	15.25	2.50	sand	SC-3	0.28	2.12	0.28	0.00	Jul-07	1.1	1	37	2	1	56	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02E-06	1.20E-06	6.01E-05	2.25E-06	1.63E-06	1.41E-04	5.53E-06
	ML-3-6	16.50	3.02	15.25	17.75	2.50	sand	SC-3	0.28	2.12	0.28	0.00	Jul-07	0.95	1	5.3	1	1	2	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.03E-07	1.20E-06	6.81E-06	1.63E-06	6.50E-06	5.53E-06	
	ML-3-7	19.00	3.02	17.75	20.00	2.25	sand and peat	SC-3	0.78	5.31	0.16	0.00	Jul-07	1	1	2	2.8	1	30	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.75E-07	6.00E-07	1.63E-06	2.28E-06	8.13E-07	3.15E-05	8.29E-05
	ML-4-2	6.50	3.22	3.40	7.75	4.35	sand	SC-3	0.28	3.94	0.28	0.00	Mar-07	1,100	1,100	13,000	9,200	1,100	13,000	9,200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.81E-05	1.11E-04	1.51E-04	7.24E-04	1.51E-04	6.08E-02	9.74E-02
	ML-4-3	9.00	3.22	7.75	10.25	2.50	sand and clay	SC-3	0.56	4.48	0.06	0.00	Mar-07	770	330	40,000	2,500	200	27,000	2,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57E-04	8.47E-05	1.39E-02	8.70E-04	6.96E-05	1.46E-02	2.37E-03
	ML-4-4	11.50	3.22	10.25	12.75	2.50	sand	SC-3	0.28	2.26	0.00	0.00	Jul-07	20	20	120	200	20	3,500	1,400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.03E-08	2.56E-08	1.40E-03	3.81E-05	3.47E-05	8.87E-03	8.25E-03
	ML-4-5	14.00	3.22	12.75	15.25	2.50	sand	SC-3	0.28	2.26	0.28	0.00	Jul-07	20	20	810	22	20	3,300	1,400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.03E-05	2.56E-05	1.40E-03	3.81E-05	3.47E-05	8.87E-03	8.25E-03
	ML-4-6	16.50	3.22	15.25	17.75	2.50	sand	SC-3	0.28	2.26	0.28	0.00	Jul-07	50	50	140	50	50	6,400	1,200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.07E-04	6.39E-04	2.43E-04	9.36E-05	8.67E-05	1.72E-02	7.07E-03
	ML-4-7	19.00	3.22	17.75	20.00	2.25	sand and peat	SC-3	0.78	5.66	0.16	0.00	Jul-07	10	10	97	11	10	2,600	1,500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.07E-06	6.39E-06	8.41E-05	9.53E-06	8.67E-06	3.49E-03	4.42E-03
	ML-5-2	6.50	2.71	3.40	7.75	4.35	sand	SC-3	0.28	3.31	0.28	0.00	Jul-07	400	400	330	510	400	43,000	1,400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.93E-04	7.49E-04	3.30E-04	1.29E-02	1.02E-03	1.69E-01	1.21E-02
	ML-5-3	9.00	2.71	7.75	10.25	2.50	sand and clay	SC-3	0.56	3.77	0.06	0.00	Jul-07	100	100	10,000	340	100	10,000	1,050	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.56E-05	3.67E-04	2.93E-02	1.05E-03	1.46E-04	1.32E-02	1.59E-03
	ML-5-4	11.50	2.71	10.25	12.75	2.50	sand	SC-3	0.28	1.90	0.00	0.00	Jul-07	200	200	19,000	130	100	4,200	890	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.53E-08	1.08E-07	2.77E-05	1.90E-07	1.46E-07	9.50E-06	2.93E-06
	ML-5-5	14.00	2.71	12.75	15.25	2.50	sand	SC-3	0.28	1.90	0.28	0.00	Jul-07	200	200	3,200	150	200	7,400	1,200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.71E-04	2.15E-04	4.67E-02	2.19E-04	2.92E-04	1.67E-02	5.95E-03
	ML-5-6	16.50	2.71	15.25	17.75	2.50	sand	SC-3	0.28	1.90	0.28	0.00	Jul-07	100	100	11,000	110	100	11,000	2,600	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.53E-05	1.08E-04	1.60E-02	1.60E-04	1.46E-04	2.49E-02	1.29E-02
	ML-5-7	19.00	2.71	17.75	20.00	2.25	sand and peat	SC-3	0.78	4.76	0.16	0.00	Jul-07	1,200	1,200	4,300	4,300	1,200	4,300	1,200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.12E-04	1.11E-04	3.14E-03	3.14E-05	6.93E-06	4.52E-03	8.68E-03
	ML-6-2	6.50	2.90	3.40	7.75	4.35	sand	SC-8	0.28	3.54	0.28	0.00	Jul-07	50	50	120	59	50	9,000	1,200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.94E-05	1.00E-04	3.26E-04	1.60E-04	1.36E-04	3.79E-02	1.11E-02
	ML-6-3	9.00	2.90	7.75	10.25	2.50	sand and clay	SC-8	0.59	4.28	0.03	0.00	Mar-07	200	200	75,000	2,600	200	22,000	500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.84E-05	2.32E-05	1.18E-02	4.09E-04	3.15E-05	5.37E-03	2.68E-04
	ML-6-4	11.50	2.90	10.25	12.75	2.50	sand and clay	SC-8	0.52	3.78	0.09	0.00	Jul-07	200	200	28,000	190	200	12,000	4,200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.49E-05	6.93E-05	1.31E-02	8.92E-05	9.39E-05	8.74E-03	6.70E-03
	ML-6-5	14.00	2.90	12.75	15.25	2.50	sand	SC-8	0.28	2.04	0.28	0.00	Jul-07	200	200	14,000	400	200	14,000	4,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.65E-04	4.61E-04	1.08E-01	5.46E-04	6.24E-04	3.39E-02	3.61E-02
	ML-6-6	16.50	2.90	15.25	17.75	2.50	sand	SC-8	0.28	2.04	0.28	0.00	Jul-07	400	400	28,000	270	400	18,000	4,400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.65E-04	4.61E-04	1.18E-02	4.21E-04	6.24E-04	4.36E-02	2.34E-02
	ML-6-7	19.00	2.90	17.75	20.00	2.25	sand and peat	SC-8	0																									

TABLE E-37: CALCULATION OF POST-INJECTION (JANUARY AND JULY 2008) MASS FLUX ESTIMATES FOR PNEUMATIC INJECTION TEST PLOT - 5 WELLS
Parris Island, South Carolina

Water level (assumed) 3.4 ft bgs

Soil Type	Porosity ^a	K ^b (ft/d)	Gradient ^c ft/ft
sand	0.281	0.2834646	0.0026
clay	0.625	0.0002835	0.0026
peat	0.844	0.117322	0.0026

a - porosity estimates from SC-9 results
b - assumed from literature search
c - gradient from RI (median of Nov 2001 gradients)

	Well ID	Screen Midpoint (ft)	Width (ft)	Depth Interval Top Bottom (ft)	Thickness (ft)	Soil Type from SC	Weighted Porosity	Effective Area (ft ²)	Weighted K (ft/d)	GW Velocity (ft/d)	Pre-Injection VOC & DHG Concentrations (µg/L)						Post-Injection VOC Flux (µg/d)						Post-Injection VOC & DHG Flux (mmol/d)												
											PCE	TCE	cDCE	tDCE	1,1-DCE	VC	Ethene	PCE	TCE	cDCE	tDCE	1,1-DCE	VC	Ethene	PCE	TCE	cDCE	tDCE	VC	Ethene					
Uppgradient wells	ML-1-2	6.50	7.50	3.40	7.75	4.35	sand and clay	SC-9	0.35	11.43	0.25	0.00	Jan-08	200	2,200	81,000	2,300	52	15,000	1,300	0.00	0.00	0.00	0.04	0.00	0.00	0.01	0.00	6.56E-04	9.11E-03	4.55E-01	1.29E-02	2.92E-04	1.31E-01	2.48E-02
	ML-1-3	9.00	7.50	7.75	10.25	2.50	clay	SC-9	0.63	11.72	0.00	0.00	Jan-08	100	43	14,000	980	100	12,000	1,100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.36E-07	1.28E-07	5.65E-05	3.96E-06	4.04E-07	7.51E-05	1.51E-05	
	ML-1-4	11.50	7.50	10.25	12.75	2.50	clay and sand	SC-9	0.52	9.78	0.09	0.00	Jan-08	20	20	3,500	240	4	2,900	490	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42E-05	1.79E-05	4.25E-03	2.91E-04	4.86E-06	5.46E-03	2.02E-03	
	ML-1-5	14.00	7.50	12.75	15.25	2.50	sand	SC-9	0.28	5.27	0.28	0.00	Jan-08	20	6	2,100	150	20	1,800	190	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.72E-05	1.79E-05	8.48E-03	6.05E-04	8.07E-05	1.13E-02	2.61E-03	
	ML-1-6	16.50	7.50	15.25	17.75	2.50	sand	SC-9	0.28	5.27	0.28	0.00	Jan-08	25.0	5.2	2,700	93	25	380	26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.90E-05	1.55E-05	1.00E-02	3.75E-04	1.01E-04	2.38E-03	3.57E-04	
	ML-1-7	19.00	7.50	17.75	20.00	2.25	sand and peat	SC-9	0.78	13.19	0.16	0.00	Jan-08	2	0.54	330	17	2	150	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.36E-06	8.04E-07	6.66E-04	3.43E-05	4.04E-06	4.70E-04	1.24E-04	
	ML-2-2	6.00	7.50	3.40	7.25	3.85	sand	SC-7	0.28	8.11	0.28	0.00	Jul-08	240	630	130,000	820	500	100,000	12,000	0.00	0.00	0.08	0.00	0.00	0.06	0.01	8.72E-04	2.89E-03	8.08E-01	5.10E-03	3.11E-03	9.64E-01	2.54E-01	
	ML-2-3	8.50	7.50	7.25	9.75	2.50	sand and clay	SC-7	0.52	9.78	0.09	0.00	Jan-08	240	540	69,000	200	500	30,000	4,700	0.00	0.00	0.01	0.00	0.00	0.00	0.00	1.70E-04	4.84E-04	8.38E-02	2.43E-04	6.07E-04	5.65E-02	1.94E-02	
	ML-2-4	11.00	7.50	9.75	12.25	2.50	clay and sand	SC-7	0.59	11.07	0.03	0.00	Jan-08	240	2,900	69,000	520	120	42,000	7,300	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.71E-05	8.71E-04	2.81E-02	2.12E-04	4.89E-05	2.65E-02	1.01E-02	
	ML-2-5	13.50	7.50	12.25	14.75	2.50	sand	SC-7	0.28	5.27	0.28	0.00	Jan-08	150,000	8,100	6,100	1,000	1,000	1,400	170	0.06	0.00	0.00	0.00	0.00	0.00	0.00	3.54E-01	2.41E-02	2.44E-02	4.04E-03	4.04E-03	8.77E-03	2.33E-03	
	ML-2-6	16.00	7.50	14.75	17.25	2.50	sand	SC-7	0.28	5.27	0.28	0.00	Jan-08	130,000	7,200	10,800	1,000	1,000	830	97	0.05	0.00	0.00	0.00	0.00	0.00	0.00	3.07E-01	2.14E-02	4.04E-02	4.04E-03	4.04E-03	5.20E-03	1.33E-03	
	ML-2-7	18.50	7.50	17.25	20.00	2.75	sand and peat	SC-7	0.69	14.24	0.18	0.00	Jan-08	190,000	10,000	27,000	2,000	2,000	940	110	0.05	0.00	0.01	0.00	0.00	0.00	0.00	3.14E-01	2.08E-02	7.63E-02	5.63E-03	4.12E-03	1.06E-03		
											Total																								
											0.16						0.01						0.15						0.00						
Downgradient wells	ML-3-2	6.50	3.02	3.40	7.75	4.35	sand	SC-3	0.28	3.69	0.28	0.00	Jul-08	0.41	1	5.5	0.22	1	1.3	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.78E-07	2.09E-06	1.56E-05	6.22E-07	2.83E-06	5.70E-06	1.15E-04	
	ML-3-3	9.00	3.02	7.75	10.25	2.50	sand and clay	SC-3	0.56	4.20	0.06	0.00	Jan-08	0.3	1	1.3	1	17	86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.30E-08	2.41E-07	2.35E-07	4.24E-07	3.26E-07	8.61E-06	9.55E-05		
	ML-3-4	11.50	3.02	10.25	12.75	2.50	sand	SC-3	0.28	2.12	0.00	0.00	Jan-08	1.4	1.1	11	1	1	25	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33E-09	1.32E-09	1.79E-08	1.63E-09	1.63E-09	6.30E-08	7.19E-09	
	ML-3-5	14.00	3.02	12.75	15.25	2.50	sand	SC-3	0.28	2.12	0.28	0.00	Jan-08	0.47	0.61	4.3	0.59	1	8.9	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.47E-07	7.32E-07	6.09E-06	9.59E-07	1.63E-06	2.24E-05	5.53E-06	
	ML-3-6	16.50	3.02	15.25	17.75	2.50	sand	SC-3	0.28	2.12	0.28	0.00	Jul-08	0.77	0.21	2.3	1	1	2.1	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.32E-07	2.52E-07	3.74E-06	1.63E-06	1.63E-06	5.29E-06	5.53E-06	
	ML-3-7	19.00	3.02	17.75	20.00	2.25	sand and peat	SC-3	0.78	5.31	0.16	0.00	Jan-08	0.52	1	0.28	2.2	1	5.5	4.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.47E-07	6.00E-07	2.28E-07	1.79E-06	8.13E-07	6.93E-06	1.16E-05	
	ML-4-2	6.50	3.22	3.40	7.75	4.35	sand	SC-3	0.28	3.94	0.28	0.00	Jan-08	20	20	25	20	20	2,300	17,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.53E-05	4.45E-05	6.94E-05	6.03E-05	6.03E-05	1.08E-02	1.74E-01	
	ML-4-3	9.00	3.22	7.75	11.50	3.75	sand and clay	SC-3	0.464	5.61	0.13	0.00	Jan-08	100	100	7,300	960	100	11,000	4,200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.10E-05	8.96E-05	8.87E-03	1.17E-03	1.21E-04	2.07E-02	1.74E-02	
	ML-4-5	14.00	3.22	11.50	15.25	3.75	sand	SC-3	0.281	3.39	0.28	0.00	Jan-08	20	170	1900	22	5	2,000	780	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.04E-05	3.26E-04	4.94E-03	5.72E-05	1.30E-05	8.06E-03	6.90E-03	
	ML-4-6	16.50	3.22	15.25	17.75	2.50	sand	SC-3	0.28	2.26	0.28	0.00	Jan-08	20	61	790	18	20	2,000	890	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.03E-05	7.80E-05	1.37E-03	3.12E-05	3.47E-05	5.38E-03	5.25E-03	
	ML-4-7	19.00	3.22	17.75	20.00	2.25	sand and peat	SC-3	0.78	5.66	0.16	0.00	Jan-08	10	10	18	11	10	930	660	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.07E-06	6.39E-06	1.56E-05	9.53E-06	8.67E-06	1.25E-03	1.95E-03	
	ML-5-2	6.50	2.71	3.40	7.75	4.35	sand	SC-3	0.28	3.31	0.28	0.00	Jan-08	100	100	160	170	100	17,900	25,000	0.00	0.00	0.00	0.00	0.00	0.01	1.48E-04	1.87E-04	4.06E-04	4.31E-04	2.54E-04	6.69E-02	2.16E-01		
	ML-5-3	9.00	2.71	7.75	10.25	2.50	sand and clay	SC-3	0.56	3.77	0.06	0.00	Jan-08	500	500	46,000	2,300	500	32,000	8,700	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.56E-05	1.08E-04	1.35E-02	6.74E-04	1.46E-04	1.45E-02	8.67E-03	
	ML-5-4	11.50	2.71	10.25	12.75	2.50	sand	SC-3	0.28	1.90	0.00	0.00	Jan-08	25	25	4,400	86	25	1,700	400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.11E-08	2.69E-08	6.42E-06	1.25E-07	3.65E-08	3.85E-06	1.98E-06	
	ML-5-5	14.00	2.71	12.75	15.25	2.50	sand	SC-3	0.28	1.90	0.28	0.00	Jan-08	200	200	31,000	160	44	5,000	1,900	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.71E-04	2.15E-04	4.52E-02	2.33E-04	6.42E-05	1.13E-02	8.93E-03	
	ML-5-6	16.50	2.71	15.25	17.75	2.50	sand	SC-3	0.28	1.90	0.28	0.00	Jan-08	100	100	9,600	100	100	13,900	5,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.53E-05	1.08E-04	1.40E-02	1.46E-04	1.46E-04	2.94E-02	2.48E-02	
	ML-5-7	19.00	2.71	17.75	20.00	2.25	sand and peat	SC-3	0.78	4.76	0.16	0.00	Jan-08	3,600	550	4,900	50	50	6,200	2,800	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.53E-03	2.96E-04	3.57E-03	3.65E-05	3.65E-05	7.01E-03	6.95E-03	
	ML-6-2	6.50	2.90	3.40	7.75	4.35	sand	SC-8	0.28	3.54	0.28	0.00	Jul-08	10	10	21	16	10	1,000	14,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59E-05	2.00E-05	5.70E-05	4.35E-05	2.72E-05	4.21E-03	1.29E-01	
	ML-6-3	9.00	2.90	7.75	10.25	2.50	sand and clay	SC-8	0.59	4.28	0.03	0.00	Jan-08	250	250	20,000	1,900	250	43,000	13,000	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.35E-05	2.90E-05	1.31E-03	2.99E-04	3.94E-04	1.05E-02	6.96E-03
ML-6-4	11.50	2.90	10.25	12.75	2.50	sand and clay	SC-8	0.58	4.08	0.38	0.00	Jan-08	83	130	14,000	57,000	130	13,000	1,400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30E-05	1.63E-05	2.68E-03	1.64E-03	7.03E-04	7.03E-04	7.03E-04		
ML-6-5	14.00	2.90	12.75	15.25	2.50	sand	SC-8	0.28	2.08	0.28	0.00	Jan-08	280	440	8,500	480	140	11,000	7,400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35E-05	5.07E-05	6.31E-03	2.19E-04	2.19E-04	2.19E-04	2.35E-02		
ML-6-6	16.50	2.90	15.25	17.75	2.50	sand	SC-8	0.28	2.04	0.28	0.00	Jan-08	500	780	46,000	280	500	17,000	7,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.05E-04	8.98E-04	7.18E-02	4.37E-04	7.88E-04	4.12E-02	3.72E-02		
ML-6-7	19.00	2.90	17.75	20.00	2.25	sand and peat	SC-8	0.78	5.10	0.16	0.00	Jan-08	2,200	320	9,600	87	22	12,000	4,800	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00E-03	1.84E-04	7.14E-04	6.79E-05	1.72E-05	1.45E-02	1.27E-02		
ML-7-2	6.50	3.13	7.25	9.75	2.50	sand	SC-8	0.52	4.08	0.09	0.00	Jan-08	50	8400	50	39	50	8,400	5																

TABLE E-38: CALCULATION OF POST-DEMONSTRATION MASS FLUX ESTIMATES FOR PNEUMATIC INJECTION TEST PLOT - 5 WELLS
Parris Island, South Carolina

Geosyntec Consultants

Water level (assumed) 3.4 ft bgs

Soil Type	Porosity ^a	K ^b (ft/d)	Gradient ^c ft/ft
sand	0.281	0.2834646	0.0026
clay	0.625	0.0002835	0.0026
peat	0.844	0.1417321	0.0026

a - porosity estimates from SC-9 results
b - assumed from literature search
c - gradient from RI (median of Nov 2001 gradients)

	Well ID	Screen Midpoint (ft)	Width (ft)	Depth Interval Top Bottom (ft)	Thickness (ft)	Soil Type from SC	Weighted Porosity	Effective Area (ft ²)	Weighted K _x (ft/d)	GW Velocity (ft/d)	Sample Event	Pre-Injection VOC & DRG Concentrations (µg/L)						Post-Injection VOC & DRG Flux (g/d)						Post-Injection VOC & DRG Flux (mmol/d)										
												PCE	TCE	cDCE	dDCE	1,1-DCE	VC	Ethene	PCE	TCE	cDCE	dDCE	1,1-DCE	VC	Ethene	PCE	TCE	cDCE	dDCE	VC	Ethene			
Upgradient wells	ML-1-2	6.50	7.50	3.40	7.75	4.35	sand and clay	SC-9	0.35	11.43	0.23	0.00	07-Mar-09	500	500	70,000	1,700	500	12,000	1,700	0.00	0.00	0.04	0.00	0.00	0.01	0.00	1.64E-03	2.07E-03	3.93E-01	9.54E-03	2.81E-03	1.04E-01	3.25E-02
	ML-1-3	9.00	7.50	7.75	10.25	2.50	clay	SC-9	0.63	11.72	0.00	0.00	07-Mar-09	100	100	16,000	790	100	6,900	1,200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.36E-07	2.98E-07	6.46E-05	3.19E-06	4.04E-07	4.32E-05	1.65E-05
	ML-1-4	11.50	7.50	10.25	12.75	2.50	clay and sand	SC-9	0.52	9.78	0.09	0.00	09-Mar-09	20	20	3,000	200	20	2,000	380	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42E-05	1.79E-05	3.64E-03	2.43E-04	2.43E-05	3.77E-03	1.57E-03
	ML-1-5	14.00	7.50	12.75	15.25	2.50	sand	SC-9	0.28	5.27	0.28	0.00	09-Mar-09	10	10	1,900	120	10	1,200	240	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.36E-05	3.98E-05	7.67E-03	4.84E-04	4.04E-05	7.51E-03	3.70E-03
	ML-1-6	16.50	7.50	15.25	17.75	2.50	sand	SC-9	0.28	5.27	0.28	0.00	09-Mar-09	25	43	3,100	57	25	280	28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.90E-05	1.28E-04	1.25E-02	2.30E-04	1.01E-04	1.75E-03	3.84E-04
	ML-1-7	19.00	7.50	17.75	20.00	2.25	sand and peat	SC-9	0.78	13.19	0.16	0.00	09-Mar-09	1	4.5	170	8.2	1	65	17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18E-06	6.70E-06	3.43E-04	1.66E-05	2.02E-06	2.03E-04	1.17E-04
	ML-2-2	6.00	7.50	3.40	7.25	3.85	sand	SC-7	0.81	0.28	0.00	0.00	05-Mar-09	510	500	66,000	500	500	35,000	16,000	0.00	0.00	0.04	0.00	0.00	0.02	0.01	1.85E-03	2.29E-03	4.10E-01	3.11E-03	3.11E-03	3.37E-01	3.38E-01
	ML-2-3	8.50	7.50	7.25	9.75	2.50	sand and clay	SC-7	0.52	9.78	0.09	0.00	05-Mar-09	250	250	59,000	330	250	25,000	6,100	0.00	0.00	0.01	0.00	0.00	0.00	0.00	1.77E-04	2.24E-04	7.16E-02	4.01E-04	3.03E-04	4.71E-02	2.32E-02
	ML-2-4	11.00	7.50	9.75	12.25	2.50	clay and sand	SC-7	0.59	11.07	0.03	0.00	06-Mar-09	250	580	59,000	360	250	19,000	4,600	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.95E-05	1.74E-04	2.40E-02	1.47E-04	1.02E-04	1.20E-02	6.37E-03
	ML-2-5	13.50	7.50	12.25	14.75	2.50	sand	SC-7	0.28	5.27	0.28	0.00	06-Mar-09	110,000	29,000	12,000	1,000	1,000	1,700	160	0.04	0.01	0.00	0.00	0.00	0.00	0.00	2.60E-01	8.64E-02	4.84E-02	4.04E-03	4.04E-03	1.06E-02	2.20E-03
ML-2-6	16.00	7.50	14.75	17.25	2.50	sand	SC-7	0.28	5.27	0.28	0.00	06-Mar-09	130,000	10,000	22,000	1,300	1,300	2,000	370	0.05	0.00	0.01	0.00	0.00	0.00	0.00	3.07E-01	2.98E-02	8.88E-02	5.25E-03	5.25E-03	1.25E-02	5.00E-03	
ML-2-7	18.50	7.50	17.25	20.00	2.75	sand and peat	SC-7	0.69	14.24	0.18	0.00	06-Mar-09	180,000	13,000	33,000	1,300	1,300	1,300	310	0.05	0.00	0.01	0.00	0.00	0.00	0.00	2.97E-01	2.71E-02	9.32E-02	3.67E-03	3.67E-03	5.70E-03	2.98E-03	
												Total							0.14	0.02	0.11	0.00	0.00	0.00	0.03	0.01	0.87	0.15	1.15	0.03	0.02	0.03	0.02	0.03
Downgradient wells	ML-3-2	6.50	3.02	3.40	7.75	4.35	sand	SC-3	0.28	3.69	0.28	0.00	12-Mar-09	1	1	1	1.2	1	1.8	17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.65E-06	2.09E-06	2.83E-06	3.39E-06	2.83E-06	7.90E-06	1.64E-04
	ML-3-3	9.00	3.02	7.75	10.25	2.50	sand and clay	SC-3	0.56	4.20	0.06	0.00	13-Mar-09	1	1	1	3.3	1	2.8	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.91E-07	2.41E-07	3.26E-07	1.08E-06	3.26E-07	1.42E-06	1.55E-05
	ML-3-4	11.50	3.02	10.25	12.75	2.50	sand	SC-3	0.28	2.12	0.00	0.00	14-Mar-09	1	1	1	1	1	2.8	7.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.50E-10	1.20E-09	1.63E-09	1.63E-09	1.63E-09	7.06E-09	4.15E-08
	ML-3-5	14.00	3.02	12.75	15.25	2.50	sand	SC-3	0.28	2.12	0.28	0.00	14-Mar-09	1	1	1	1	1	1.4	2.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.50E-07	1.20E-06	1.63E-06	1.63E-06	1.63E-06	3.53E-06	1.55E-05
	ML-3-6	16.50	3.02	15.25	17.75	2.50	sand	SC-3	0.28	2.12	0.28	0.00	14-Mar-09	1	1	2.3	1	1	1.9	1.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.50E-07	1.20E-06	3.74E-06	1.63E-06	1.63E-06	4.79E-06	9.40E-06
	ML-3-7	19.00	3.02	17.75	20.00	2.25	sand and peat	SC-3	0.78	5.31	0.16	0.00	14-Mar-09	13,000	2,200	2,000	18	7.2	260	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.18E-03	1.32E-03	1.63E-03	1.46E-05	5.85E-06	3.28E-04	2.76E-04
	ML-4-2	6.50	3.22	3.40	7.75	4.35	sand	SC-3	0.28	3.94	0.28	0.00	11-Mar-09	2.5	25	68	33	2.5	490	2100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.41E-06	5.56E-06	2.05E-04	9.95E-05	7.54E-06	2.29E-03	2.15E-02
	ML-4-3	9.00	3.22	7.75	10.25	2.50	sand and clay	SC-3	0.56	4.48	0.06	0.00	11-Mar-09	50	50	7,200	690	50	8,600	2,900	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02E-05	1.28E-05	2.51E-03	2.40E-04	1.74E-05	4.64E-03	3.43E-03
	ML-4-4	11.50	3.22	10.25	12.75	2.50	sand	SC-3	0.28	2.26	0.00	0.00	12-Mar-09	5	5	530	69	5	970	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.07E-09	6.39E-09	9.19E-07	1.20E-07	8.67E-09	2.61E-06	2.00E-06
	ML-4-5	14.00	3.22	12.75	15.25	2.50	sand	SC-3	0.28	2.26	0.28	0.00	12-Mar-09	5	63	800	29	5	740	360	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.07E-06	6.06E-05	1.39E-03	5.03E-05	8.67E-06	1.99E-03	2.12E-03
	ML-4-6	16.50	3.22	15.25	17.75	2.50	sand	SC-3	0.28	2.26	0.28	0.00	12-Mar-09	5	13	480	21	5	1,200	400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.07E-06	1.66E-05	8.32E-04	3.64E-05	8.67E-06	3.23E-03	2.36E-03
	ML-4-7	19.00	3.22	17.75	20.00	2.25	sand and peat	SC-3	0.78	5.66	0.16	0.00	12-Mar-09	2.5	2.5	10	3.7	2.5	330	130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27E-06	1.60E-06	8.67E-06	3.21E-06	2.17E-06	4.44E-04	3.83E-04
	ML-5-2	6.50	2.71	3.40	7.75	4.35	sand	SC-3	0.28	3.31	0.28	0.00	06-Mar-09	100	100	100	110	100	12,000	16,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.48E-04	1.87E-04	2.54E-04	2.79E-04	2.54E-04	4.72E-02	1.38E-01
	ML-5-3	9.00	2.71	7.75	10.25	2.50	sand and clay	SC-3	0.56	3.77	0.06	0.00	06-Mar-09	200	200	4,200	720	200	15,000	29,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.42E-05	4.32E-05	1.23E-03	2.11E-04	5.86E-05	6.81E-03	2.89E-02
	ML-5-4	11.50	2.71	10.25	12.75	2.50	sand	SC-3	0.28	1.90	0.00	0.00	07-Mar-09	25	25	13,000	120	25	4,900	20,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13E-08	2.69E-08	3.90E-05	1.75E-07	3.65E-08	1.11E-05	9.92E-05
	ML-5-5	14.00	2.71	12.75	15.25	2.50	sand	SC-3	0.28	1.90	0.28	0.00	07-Mar-09	200	200	25,000	200	200	10,000	990	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.71E-04	2.15E-04	3.65E-02	2.92E-04	2.92E-04	2.26E-02	4.86E-03
	ML-5-6	16.50	2.71	15.25	17.75	2.50	sand	SC-3	0.28	1.90	0.28	0.00	07-Mar-09	50	50	8,300	76	50	7,900	2,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.26E-05	5.38E-05	1.21E-02	1.11E-04	7.29E-05	1.79E-02	9.92E-03
	ML-5-7	19.00	2.71	17.75	20.00	2.25	sand and peat	SC-3	0.78	4.76	0.16	0.00	07-Mar-09	3,400	680	1,400	25	25	2,100	4,400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45E-03	1.66E-04	1.02E-03	1.82E-05	1.82E-05	2.38E-03	1.09E-02
	ML-6-2	6.50	2.90	3.40	7.75	4.35	sand	SC-8	0.28	3.54	0.28	0.00	10-Mar-09	10	10	33	30	10	980	4000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59E-05	2.00E-05	8.96E-05	8.15E-05	2.72E-05	4.13E-03	3.70E-02
	ML-6-3	9.00	2.90	7.75	10.25	2.50	sand and clay	SC-8	0.59	4.28	0.03	0.00	10-Mar-09	100	100	14,000	910	100	12,000	34,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57E-05	1.16E-05	2.20E-03	4.13E-04	1.57E-05	2.39E-03	1.82E-02
	ML-6-4	11.50	2.90	10.25	12.75	2.50	sand and clay	SC-8	0.52	3.79	0.09	0.00	11-Mar-09	80	80	10,000	110	80	5,500	23,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.19E-05	2.77E-05	4.69E-03	5.16E-05	3.73E-05	4.08E-03	3.67E-02
	ML-6-5	14.00	2.90	12.75	15.25	2.50	sand	SC-8	0.28	2.04	0.28	0.00	11-Mar-09	500	500	7,200	500	500	8,900	17,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.54E-04	1.17E-04	7.87E-04	8.49E-05	7.87E-05	1.47E-03	1.30E-02
ML-6-6	16.50	2.90	15.25	17.75	2.50	sand	SC-8	0.28	2.04	0.28	0.00																							

TABLE E-39: SUMMARY OF POST-INJECTION (NOVEMBER 2006 and JANUARY 2007) MASS FLUX ESTIMATES FOR PNEUMATIC INJECTION TEST PLOT - 5 WELLS
Parris Island, South Carolina

Geosyntec Consultants

	Units	PCE	TCE	cDCE	tDCE	1,1-DCE	VC	Ethene	Units	PCE	TCE	cDCE	tDCE	1,1-DCE	VC	Ethene
<i>Pre-Injection Flux</i>																
Upgradient	g/d	0.12	0.02	0.14	0.00	0.00	0.01	0.00	mmol/d	0.71	0.17	1.39	0.02	0.01	0.11	0.04
Downgradient	g/d	0.01	0.00	0.12	0.00	0.00	0.01	0.00	mmol/d	0.07	0.03	1.26	0.03	0.01	0.17	0.04
<i>Post-Injection Flux</i>																
Upgradient	g/d	0.41	0.01	0.14	0.00	0.00	0.01	0.00	mmol/d	2.49	0.09	1.46	0.03	0.02	0.22	0.09
Downgradient	g/d	0.01	0.00	0.06	0.00	0.00	0.05	0.01	mmol/d	0.04	0.03	0.62	0.02	0.01	0.75	0.20
<i>Mass Flux Reduction</i>																
Pre-injection	g/d	90.2%	79.7%	9.6%	-53.4%	42.2%	-52.1%	4.1%								
Post-injection	g/d	98.4%	68.3%	57.2%	34.9%	61.0%	-243.6%	-119.4%								

Notes:

g/d - grams per day
mmol/d - millimols per day

Plot depth 20 ft bgs
water level (assumed) 3.4 ft bgs
Normalized area 249 ft²

<i>Pre-Injection Flux</i>																
Upgradient	mg/yr/ft ²	172.46	32.24	197.93	2.32	1.36	10.11	1.55	mmol/yr/ft ²	1,039.95	245.39	2,041.78	23.94	14.04	161.84	54.50
Downgradient	mg/yr/ft ²	16.90	6.54	178.99	3.56	0.79	15.39	1.49	mmol/yr/ft ²	101.91	49.75	1,846.39	36.72	8.12	246.23	52.24
<i>Post-Injection Flux</i>																
Upgradient	mg/yr/ft ²	604.80	16.77	207.04	3.80	2.17	20.08	3.81	mmol/yr/ft ²	3,647.11	127.62	2,135.74	39.24	22.35	321.25	133.51
Downgradient	mg/yr/ft ²	9.70	5.32	88.64	2.47	0.84	69.00	8.35	mmol/yr/ft ²	58.50	40.48	914.38	25.53	8.72	1,103.97	292.93

Notes:

g/d - grams per day
mmol/day - millimols per day
ft bgs - feet below ground surface
ft² - square foot
mg/yr/ft² - milligrams per year per square foot
mmol/yr/ft² - millimols per year per square foot

TABLE E-40: SUMMARY OF POST-INJECTION (MARCH and JULY 2007) MASS FLUX ESTIMATES FOR PNEUMATIC INJECTION TEST PLOT - 5 WELLS
Parris Island, South Carolina

Geosyntec Consultants

	Units	PCE	TCE	cDCE	tDCE	1,1-DCE	VC	Ethene	Units	PCE	TCE	cDCE	tDCE	1,1-DCE	VC	Ethene
<i>Pre-Injection Flux</i>																
Upgradient	g/d	0.12	0.02	0.14	0.00	0.00	0.01	0.00	mmol/d	0.71	0.17	1.39	0.02	0.01	0.11	0.04
Downgradient	g/d	0.01	0.00	0.12	0.00	0.00	0.01	0.00	mmol/d	0.07	0.03	1.26	0.03	0.01	0.17	0.04
<i>Post-Injection Flux</i>																
Upgradient	g/d	0.15	0.01	0.14	0.00	0.00	0.03	0.0	mmol/d	0.92	0.07	1.47	0.03	0.02	0.48	0.16
Downgradient	g/d	0.00	0.00	0.04	0.00	0.00	0.04	0.0	mmol/d	0.00	0.00	0.42	0.01	0.00	0.64	0.35
<i>Mass Flux Reduction</i>																
Pre-injection	g/d	90.2%	79.7%	9.6%	-53.4%	42.2%	-52.1%	4.1%								
Post-injection	g/d	99.6%	94.6%	71.3%	71.8%	81.3%	-32.5%	-44.2%								

Notes:

g/d - grams per day

Plot depth 20 ft bgs

water level (assumed) 3.4 ft bgs

Normalized area 249 ft²

<i>Pre-Injection Flux</i>																
Upgradient	mg/yr/ft ²	172.46	32.24	197.93	2.32	1.36	10.11	1.55	mmol/yr/ft ²	1,039.95	245.39	2,041.78	23.94	14.04	161.84	54.50
Downgradient	mg/yr/ft ²	16.90	6.54	178.99	3.56	0.79	15.39	1.49	mmol/yr/ft ²	101.91	49.75	1,846.39	36.72	8.12	246.23	52.24
<i>Post-Injection Flux</i>																
Upgradient	mg/yr/ft ²	222.72	13.14	208.20	3.75	3.24	43.94	17.46	mmol/yr/ft ²	1,343.06	99.98	2,147.75	38.66	33.43	703.10	240.53
Downgradient	mg/yr/ft ²	0.95	0.70	59.82	1.06	0.61	58.21	25.17	mmol/yr/ft ²	5.74	5.35	617.13	10.91	6.26	931.42	513.54

Notes:

g/d - grams per day

mmol/day - millimols per day

ft bgs - feet below ground surface

ft² - square foot

mg/yr/ft² - milligrams per year per square foot

mmol/yr/ft² - millimols per year per square foot

TABLE E-41: SUMMARY OF POST-INJECTION (JANUARY and JULY 2008) MASS FLUX ESTIMATES FOR PNEUMATIC INJECTION TEST PLOT - 5 WELLS
Parris Island, South Carolina

Geosyntec Consultants

	Units	PCE	TCE	cDCE	tDCE	1,1-DCE	VC	Ethene	Units	PCE	TCE	cDCE	tDCE	1,1-DCE	VC	Ethene
<i>Pre-Injection Flux</i>																
Upgradient	g/d	0.12	0.02	0.14	0.00	0.00	0.01	0.00	mmol/d	0.71	0.17	1.39	0.02	0.01	0.11	0.04
Downgradient	g/d	0.01	0.00	0.12	0.00	0.00	0.01	0.00	mmol/d	0.07	0.03	1.26	0.03	0.01	0.17	0.04
<i>Post-Injection Flux</i>																
Upgradient	g/d	0.16	0.01	0.15	0.00	0.00	0.08	0.01	mmol/d	0.98	0.08	1.54	0.03	0.02	1.22	0.32
Downgradient	g/d	0.00	0.00	0.04	0.00	0.00	0.02	0.02	mmol/d	0.00	0.01	0.44	0.01	0.00	0.40	0.84
<i>Mass Flux Reduction</i>																
Pre-injection	g/d	90.2%	79.7%	9.6%	-53.4%	42.2%	-52.1%	4.1%								
Post-injection	g/d	99.6%	89.7%	71.3%	84.0%	86.6%	67.2%	-165.8%								

Notes:

g/d - grams per day

Plot depth 20 ft bgs

water level (assumed) 3.4 ft bgs

Normalized area 249 ft²

<i>Pre-Injection Flux</i>																
Upgradient	mg/yr/ft ²	172.46	32.24	197.93	2.32	1.36	10.11	1.55	mmol/yr/ft ²	1,039.95	245.39	2,041.78	23.94	14.04	161.84	54.50
Downgradient	mg/yr/ft ²	16.90	6.54	178.99	3.56	0.79	15.39	1.49	mmol/yr/ft ²	101.91	49.75	1,846.39	36.72	8.12	246.23	52.24
<i>Post-Injection Flux</i>																
Upgradient	mg/yr/ft ²	237.35	15.37	218.86	4.76	2.55	111.36	13.28	mmol/yr/ft ²	1,431.31	117.01	2,257.73	49.10	26.34	1,781.76	466.02
Downgradient	mg/yr/ft ²	1.05	1.58	62.80	0.76	0.34	36.49	35.30	mmol/yr/ft ²	6.34	12.06	647.78	7.85	3.52	583.91	1,238.64

Notes:

g/d - grams per day

mmol/day - millimols per day

ft bgs - feet below ground surface

ft² - square foot

mg/yr/ft² - milligrams per year per square foot

mmol/yr/ft² - millimols per year per square foot

TABLE E-42: SUMMARY OF POST-DEMONSTRATION MASS FLUX ESTIMATES FOR PNEUMATIC INJECTION TEST PLOT - 5 WELLS
Parris Island, South Carolina

Geosyntec Consultants

	Units	PCE	TCE	cDCE	tDCE	1,1-DCE	VC	Ethene	Units	PCE	TCE	cDCE	tDCE	1,1-DCE	VC	Ethene
<i>Pre-Injection Flux</i>																
Upgradient	g/d	0.12	0.02	0.14	0.00	0.00	0.01	0.00	mmol/d	0.71	0.17	1.39	0.02	0.01	0.11	0.04
Downgradient	g/d	0.01	0.00	0.12	0.00	0.00	0.01	0.00	mmol/d	0.07	0.03	1.26	0.03	0.01	0.17	0.04
<i>Post-Injection Flux</i>																
Upgradient	g/d	0.15	0.01	0.14	0.00	0.00	0.03	0.0	mmol/d	0.87	0.15	1.15	0.03	0.02	0.54	0.42
Downgradient	g/d	0.00	0.00	0.04	0.00	0.00	0.04	0.0	mmol/d	0.01	0.00	0.36	0.00	0.00	0.29	0.60
<i>Mass Flux Reduction</i>																
Pre-injection	%	90.2%	79.7%	9.6%	-53.4%	42.2%	-52.1%	4.1%								
Post-injection	%	99.6%	94.6%	71.3%	71.8%	81.3%	-32.5%	-44.2%								

Notes:
g/d - grams per day

Plot depth 20 ft bgs
water level (assumed) 3.4 ft bgs
Normalized area 249 ft²

<i>Pre-Injection Flux</i>																
Upgradient	mg/yr/ft ²	172.46	32.24	197.93	2.32	1.36	10.11	1.55	mmol/yr/ft ²	1,039.95	245.39	2,041.78	23.94	14.04	161.84	54.50
Downgradient	mg/yr/ft ²	16.90	6.54	178.99	3.56	0.79	15.39	1.49	mmol/yr/ft ²	101.91	49.75	1,846.39	36.72	8.12	246.23	52.24
<i>Post-Injection Flux</i>																
Upgradient	mg/yr/ft ²	222.72	13.14	208.20	3.75	3.24	43.94	17.46	mmol/yr/ft ²	1,271.60	217.24	1,690.88	39.77	28.50	796.16	612.67
Downgradient	mg/yr/ft ²	0.95	0.70	59.82	1.06	0.61	58.21	25.17	mmol/yr/ft ²	15.44	6.96	531.24	6.20	4.75	422.00	883.18

Notes:
g/d - grams per day
mmol/day - millimols per day
ft bgs - feet below ground surface
ft² - square foot
mg/yr/ft² - milligrams per year per square foot
mmol/yr/ft² - millimols per year per square foot

TABLE E-43: CALCULATION OF PRE-INJECTION MASS FLUX ESTIMATES FOR PNEUMATIC INJECTION TEST PLOT - 3 WELLS
Parris Island, South Carolina

Geosyntec Consultants

Water level (assumed) 3.4 ft bgs

Soil Type	Porosity ^a	K ^b (ft/d)	Gradient ^c ft/ft
sand	0.281	0.283464567	0.0026
clay	0.625	0.000283465	0.0026
peat	0.844	0.141732283	0.0026

a - porosity estimates from SC-9 results
b - assumed from literature search
c - gradient from RI (median of Nov 2001 gradients)

	Well ID	Screen Midpoint (ft)	Width (ft)	Depth Interval (ft)		Thickness (ft)	Soil Type from SC	Weighted Porosity	Effective Area (ft ²)		K (ft/d)	GW Velocity (ft/d)	Sample Event	Pre-Injection VOC & DHG Concentrations (µg/L)						PCE	TCE	Pre-Injection VOC Flux (g/d)			VC	Ethene	Post-Injection VOC & DHG Flux (mmol/d)							
				Top (ft)	Bottom (ft)				PCE	TCE				cDCE	tDCE	1,1-DCE	VC	Ethene	cDCE			tDCE	1,1-DCE	VC			Ethene	PCE	TCE	cDCE	tDCE	1,1-DCE	VC	Ethene
Upgradient wells	ML-1-2	6.50	7.50	3.40	7.75	4.35	sand and clay	SC-9	0.350	11.43	0.23	0.00	Oct-06	50	50	23,000	810	50	9,900	1400	0.00	0.00	0.01	0.00	0.00	0.01	0.00	1.64E-04	2.07E-04	1.29E-01	4.55E-03	2.81E-04	8.62E-02	2.67E-02
	ML-1-3	9.00	7.50	7.75	10.25	2.50	clay	SC-9	0.625	11.72	0.00	0.00	Oct-06	50	78	3,400	410	50	6,700	820	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18E-07	2.32E-07	1.37E-05	1.66E-06	2.02E-07	4.19E-05	1.13E-05
	ML-1-4	11.50	7.50	10.25	12.75	2.50	clay and sand	SC-9	0.522	9.78	0.09	0.00	Aug-06	50	10	4,300	140	10	870	220	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.55E-05	8.96E-06	5.22E-03	1.70E-04	1.21E-05	1.64E-03	9.08E-04
	ML-1-5	14.00	7.50	12.75	15.25	2.50	sand	SC-9	0.281	5.27	0.28	0.00	Oct-06	11	1	14	18	1	120	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.60E-05	2.98E-06	5.93E-05	7.77E-05	4.04E-06	7.51E-04	4.67E-03
	ML-1-6	16.50	7.50	15.25	17.75	2.50	sand	SC-9	0.281	5.27	0.28	0.00	Aug-06	3	3	440	15	3	65	7.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.90E-06	8.34E-06	1.78E-03	6.05E-05	1.01E-05	4.07E-04	1.08E-04
	ML-1-7	19.00	7.50	17.75	20.00	2.25	sand and peat	SC-9	0.781	13.19	0.16	0.00	Oct-06	10	1	100	4	1	43	2.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18E-05	1.49E-06	2.02E-04	8.07E-06	2.02E-06	1.35E-04	1.99E-05
	ML-2-2	6.00	7.50	3.40	7.25	3.85	sand	SC-7	0.281	8.11	0.28	0.00	Aug-06	6,500	9,900	160,000	850	500	1,200	170	0.00	0.01	0.10	0.00	0.00	0.00	0.00	2.56E-02	4.49E-02	9.95E-01	5.28E-03	3.11E-03	1.14E-02	3.59E-03
	ML-2-3	8.50	7.50	7.25	9.75	2.50	sand and clay	SC-7	0.522	9.78	0.09	0.00	Oct-06	7,300	11,000	92,000	500	500	500	210	0.00	0.00	0.01	0.00	0.00	0.00	0.00	5.18E-03	9.85E-03	1.12E-01	6.07E-04	6.07E-04	9.41E-04	8.67E-04
	ML-2-4	11.00	7.50	9.75	12.25	2.50	clay and sand	SC-7	0.591	11.07	0.03	0.00	Aug-06	49,000	36,000	23,000	320	250	460	110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17E-02	1.08E-02	9.37E-03	1.30E-04	1.02E-04	2.91E-04	1.52E-04
	ML-2-5	13.50	7.50	12.25	14.75	2.50	sand	SC-7	0.281	5.27	0.28	0.00	Oct-06	180,000	4,700	3,100	500	500	500	2.3	0.07	0.00	0.00	0.00	0.00	0.00	0.00	4.25E-01	1.40E-02	1.25E-02	2.02E-03	2.02E-03	3.13E-03	3.16E-05
	ML-2-6	16.00	7.50	14.75	17.25	2.50	sand	SC-7	0.281	5.27	0.28	0.00	Aug-06	46,000	21,000	5,200	500	500	500	4.2	0.02	0.01	0.00	0.00	0.00	0.00	0.00	1.09E-01	6.25E-02	2.10E-02	2.02E-03	2.02E-03	3.13E-03	5.77E-05
	ML-2-7	18.50	7.50	17.25	20.00	2.75	sand and peat	SC-7	0.690	14.24	0.18	0.00	Oct-06	82,000	12,000	38,000	500	500	500	3.3	0.02	0.00	0.01	0.00	0.00	0.00	0.00	1.35E-01	2.50E-02	1.07E-01	1.41E-03	1.41E-03	2.19E-03	3.17E-05
														Total						0.12	0.02	0.14	0.00	0.00	0.01	0.00	0.71	0.17	1.39	0.02	0.01	0.11	0.04	
Downgradient wells	ML-4-2	6.50	3.22	3.40	7.75	4.35	sand	SC-3	0.281	3.94	0.28	0.00	Aug-06	200	200	58,000	1,500	200	9,200	480	0.00	0.00	0.02	0.00	0.00	0.00	0.00	3.53E-04	4.45E-04	1.75E-01	4.52E-03	6.03E-04	4.30E-02	4.92E-03
	ML-4-3	9.00	3.22	7.75	10.25	2.50	sand and clay	SC-3	0.556	4.48	0.06	0.00	Oct-06	100	1,400	49,000	2,000	100	7,200	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.03E-05	3.59E-04	1.71E-02	6.96E-04	3.48E-05	3.89E-03	1.18E-03
	ML-4-4	11.50	3.22	10.25	12.75	2.50	sand	SC-3	0.281	2.26	0.00	0.00	Aug-06	200	200	31,000	910	200	3,700	500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.03E-07	2.56E-07	5.37E-05	1.58E-06	3.47E-07	9.95E-06	2.95E-06
	ML-4-5	14.00	3.22	12.75	15.25	2.50	sand	SC-3	0.281	2.26	0.28	0.00	Oct-06	2,800	3,100	8,800	140	25	1,200	49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.84E-03	3.96E-03	1.53E-02	2.43E-04	4.33E-05	3.23E-03	2.89E-04
	ML-4-6	16.50	3.22	15.25	17.75	2.50	sand	SC-3	0.281	2.26	0.28	0.00	Aug-06	50	50	5,100	64	50	280	34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.07E-05	6.39E-05	8.84E-03	1.11E-04	8.67E-05	7.53E-04	2.00E-04
	ML-4-7	19.00	3.22	17.75	20.00	2.25	sand and peat	SC-3	0.781	5.66	0.16	0.00	Oct-06	7	5	990	19	5	200	9.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.44E-06	3.20E-06	8.58E-04	1.65E-05	4.33E-06	2.69E-04	2.80E-05
	ML-5-2	6.50	2.71	3.40	7.75	4.35	sand	SC-3	0.281	3.31	0.28	0.00	Aug-06	380	250	100,000	1,700	250	1,300	58	0.00	0.00	0.02	0.00	0.00	0.00	0.00	5.64E-04	4.68E-04	2.54E-01	4.31E-03	6.34E-04	5.12E-03	5.01E-04
	ML-5-3	9.00	2.71	7.75	10.25	2.50	sand and clay	SC-3	0.556	3.77	0.06	0.00	Aug-06	1,300	500	130,000	4,100	500	5,700	600	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.23E-04	1.08E-04	3.81E-02	1.30E-03	1.46E-04	2.58E-03	6.87E-04
	ML-5-4	11.50	2.71	10.25	12.75	2.50	sand	SC-3	0.281	1.90	0.00	0.00	Aug-06	340	960	31,000	440	200	400	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.90E-07	1.03E-06	4.52E-05	6.42E-07	2.92E-07	9.05E-07	2.73E-07
	ML-5-5	14.00	2.71	12.75	15.25	2.50	sand	SC-3	0.281	1.90	0.28	0.00	Aug-06	140	350	34,000	270	100	160	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.19E-04	3.77E-04	4.96E-02	3.94E-04	1.46E-04	3.62E-04	6.95E-05
	ML-5-6	16.50	2.71	15.25	17.75	2.50	sand	SC-3	0.281	1.90	0.28	0.00	Aug-06	50	50	11,000	120	50	110	7.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.26E-05	5.53E-05	1.60E-02	1.75E-04	7.29E-05	2.49E-04	3.87E-05
	ML-5-7	19.00	2.71	17.75	20.00	2.25	sand and peat	SC-3	0.781	4.76	0.16	0.00	Aug-06	10	10	1,800	28	10	30	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.26E-06	5.58E-06	1.31E-03	2.04E-05	7.29E-06	3.39E-05	2.48E-05
	ML-6-2	6.50	2.90	3.40	7.75	4.35	sand	SC-8	0.281	3.54	0.28	0.00	Aug-06	500	500	90,000	1,300	500	760	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.94E-04	1.00E-03	2.44E-01	3.53E-03	1.36E-03	3.20E-03	1.66E-04
	ML-6-3	9.00	2.90	7.75	10.25	2.50	sand and clay	SC-8	0.591	4.28	0.03	0.00	Oct-06	3,500	10,000	71,000	2,200	250	1,900	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.22E-04	1.16E-03	1.12E-02	3.46E-04	3.94E-05	4.64E-04	8.57E-06
	ML-6-4	11.50	2.90	10.25	12.75	2.50	sand and clay	SC-8	0.522	3.78	0.09	0.00	Aug-06	210	2,200	26,000	260	200	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.78E-05	7.62E-04	1.22E-02	1.22E-04	9.36E-05	1.66E-04	2.55E-05
	ML-6-5	14.00	2.90	12.75	15.25	2.50	sand	SC-8	0.281	2.04	0.28	0.00	Oct-06	39,000	6,900	15,000	250	250	250	1.2	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.58E-02	7.95E-03	2.34E-02	3.90E-04	3.90E-04	6.05E-04	6.37E-06
	ML-6-6	16.50	2.90	15.25	17.75	2.50	sand	SC-8	0.281	2.04	0.28	0.00	Aug-06	100	280	12,000	110	100	100	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.12E-05	3.22E-04	1.87E-02	1.72E-04	1.56E-04	2.42E-04	2.65E-05
	ML-6-7	19.00	2.90	17.75	20.00	2.25	sand and peat	SC-8	0.781	5.10	0.16	0.00	Oct-06	10	10	2,200	41	10	68	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.56E-06	5.74E-06	1.72E-03	3.20E-05	7.86E-06	8.23E-05	1.99E-06
														Total						0.01	0.00	0.09	0.00	0.00	0.00	0.00	0.04	0.02	0.08	0.02	0.00	0.06	0.01	

Notes:
ft bgs - feet below ground surface
ft - feet
ft/d - feet per day
ft² - square foot
µg/L - micrograms per liter
g/d - grams per day
mmol/day - millimoles per day
Bold indicates detected parameter; non-bold is quantitation limit

TABLE E-44: CALCULATION OF POST-DEMONSTRATION MASS FLUX ESTIMATES FOR PNEUMATIC INJECTION TEST PLOT - 3 WELLS
Parris Island, South Carolina

Geosyntec Consultants

Water level (assumed) 3.4 ft bgs

Post-injection			
Soil Type	Porosity ^a	K ^b (ft/d)	Gradient ^c ft/ft
sand	0.281	0.2834646	0.0026
clay	0.625	0.0002835	0.0026
peat	0.844	0.1417323	0.0026

a - porosity estimates from SC-9 results
b - assumed from literature search
c - gradient from R1 (median of Nov 2001 gradients)

	Well ID	Screen Midpoint (ft)	Width (ft)	Depth Interval Top Bottom (ft)	Thickness (ft)	Soil Type from SC	Weighted Porosity	Effective Area (ft ²)	K (ft/d)	GW Velocity (ft/d)	Pre-Injection VOC & DRG Concentrations (µg/L)						Post-Injection VOC & DRG Flux (µg/d)						Post-Injection VOC & DRG Flux (mmol/d)											
											Sample Event	PCE	TCE	cDCE	iDCE	1,1-DCE	VC	Ethene	PCE	TCE	cDCE	iDCE	1,1-DCE	VC	Ethene	PCE	TCE	cDCE	iDCE	1,1-DCE	VC	Ethene		
Upgradient wells	ML-1-2	6.50	7.50	3.40	7.75	4.35	sand and clay	SC-9	0.35	11.43	0.23	0.00	07-Mar-09	500	500	70,000	1,700	500	12,000	1,700	0.00	0.00	0.04	0.00	0.00	0.01	0.00	1.64E-03	2.07E-03	3.93E-01	9.54E-03	2.81E-03	1.04E-01	3.25E-02
	ML-1-3	9.00	7.50	7.75	10.25	2.50	clay	SC-9	0.63	11.72	0.00	0.00	07-Mar-09	100	100	16,000	790	100	6,900	1,200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.36E-07	2.98E-07	6.46E-05	3.19E-06	4.04E-07	4.32E-05	1.65E-05
	ML-1-4	11.50	7.50	10.25	12.75	2.50	clay and sand	SC-9	0.52	9.78	0.09	0.00	09-Mar-09	20	20	3,000	200	20	2,000	380	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42E-05	1.79E-05	3.64E-03	2.43E-05	3.77E-03	1.57E-03	
	ML-1-5	14.00	7.50	12.75	15.25	2.50	sand	SC-9	0.28	5.27	0.28	0.00	09-Mar-09	10	10	1,900	120	10	1,200	240	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.36E-05	2.98E-05	7.67E-03	4.84E-04	4.04E-05	7.51E-03	3.38E-03
	ML-1-6	16.50	7.50	15.25	17.75	2.50	sand	SC-9	0.28	5.27	0.28	0.00	09-Mar-09	25	43	3,100	57	25	280	28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.90E-05	1.28E-04	1.25E-02	2.30E-04	1.01E-04	1.75E-03	3.84E-04
	ML-1-7	19.00	7.50	17.75	20.00	2.25	sand and peat	SC-9	0.78	13.19	0.16	0.00	09-Mar-09	1	4.5	170	8.2	1	65	17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18E-06	6.70E-06	3.43E-04	1.66E-05	2.02E-06	2.03E-04	1.17E-04
	ML-2-2	6.00	7.50	3.40	7.25	3.85	sand	SC-7	0.28	8.11	0.28	0.00	05-Mar-09	510	500	66,000	500	500	35,000	16,000	0.00	0.00	0.04	0.00	0.00	0.02	0.01	1.85E-03	2.29E-03	4.01E-01	3.11E-03	3.11E-03	3.37E-01	3.38E-01
	ML-2-3	8.50	7.50	7.25	9.75	2.50	sand and clay	SC-7	0.52	9.78	0.09	0.00	05-Mar-09	250	250	59,000	330	250	25,000	6,100	0.00	0.00	0.01	0.00	0.00	0.00	0.00	1.77E-04	2.24E-04	7.16E-02	4.01E-04	3.03E-04	4.71E-02	2.52E-02
	ML-2-4	11.00	7.50	9.75	12.25	2.50	clay and sand	SC-7	0.59	11.07	0.03	0.00	06-Mar-09	250	580	59,000	360	250	19,000	4,600	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.95E-05	1.74E-04	2.40E-02	1.47E-04	1.02E-04	1.20E-02	6.37E-03
	ML-2-5	13.50	7.50	12.25	14.75	2.50	sand	SC-7	0.28	5.27	0.28	0.00	06-Mar-09	110,000	29,000	12,000	1,000	1,000	1,700	160	0.04	0.01	0.00	0.00	0.00	0.00	0.00	2.68E-01	8.64E-02	4.84E-02	4.04E-03	4.04E-03	1.06E-02	2.20E-03
	ML-2-6	16.00	7.50	14.75	17.25	2.50	sand	SC-7	0.28	5.27	0.28	0.00	06-Mar-09	130,000	10,000	22,000	1,300	1,300	2,000	370	0.05	0.00	0.01	0.00	0.00	0.00	0.00	3.07E-01	2.98E-02	8.88E-02	5.23E-03	5.23E-03	1.25E-02	5.08E-03
	ML-2-7	18.50	7.50	17.25	20.00	2.75	sand and peat	SC-7	0.69	14.24	0.18	0.00	06-Mar-09	180,000	13,000	33,000	1,300	1,300	1,300	310	0.05	0.00	0.01	0.00	0.00	0.00	0.00	2.97E-01	2.71E-02	9.32E-02	3.67E-03	3.67E-03	5.70E-03	2.98E-03
											Total	0.14	0.02	0.11	0.00	0.00	0.00	0.03	0.01	0.87	0.15	1.15	0.03	0.02	0.54	0.42	0.87	0.15	1.15	0.03	0.02	0.54	0.42	
Downgradient wells	ML-4-2	6.50	3.22	3.40	7.75	4.35	sand	SC-3	0.28	3.94	0.28	0.00	11-Mar-09	2.5	2.5	68	33	2.5	490	2100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.41E-06	5.56E-06	2.03E-04	9.95E-05	7.54E-06	2.29E-03	1.15E-02
	ML-4-3	9.00	3.22	7.75	10.25	2.50	sand and clay	SC-3	0.56	4.48	0.06	0.00	11-Mar-09	50	50	7,200	690	50	8,600	2,900	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02E-05	1.28E-05	2.51E-03	2.40E-04	1.74E-05	4.64E-03	3.43E-03
	ML-4-4	11.50	3.22	10.25	12.75	2.50	sand	SC-3	0.28	2.26	0.00	0.00	12-Mar-09	5	5	830	69	5	970	340	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.07E-09	6.39E-09	9.19E-07	1.20E-07	8.67E-09	2.61E-06	2.00E-06
	ML-4-5	14.00	3.22	12.75	15.25	2.50	sand	SC-3	0.28	2.26	0.28	0.00	12-Mar-09	5	63	800	29	5	740	360	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.07E-06	8.06E-05	1.39E-03	5.03E-05	8.67E-06	1.99E-03	2.12E-03
	ML-4-6	16.50	3.22	15.25	17.75	2.50	sand	SC-3	0.28	2.26	0.28	0.00	12-Mar-09	5	13	480	21	5	1,200	400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.07E-06	1.66E-05	8.32E-04	3.64E-05	8.67E-06	3.23E-03	3.26E-03
	ML-4-7	19.00	3.22	17.75	20.00	2.25	sand and peat	SC-3	0.78	5.66	0.16	0.00	12-Mar-09	2.5	2.5	10	37	2.5	330	130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27E-06	1.60E-06	8.67E-06	3.21E-06	2.17E-06	4.44E-04	3.83E-04
	ML-5-2	6.50	2.71	3.40	7.75	4.35	sand	SC-3	0.28	3.31	0.28	0.00	06-Mar-09	100	100	100	110	100	12,000	16,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.48E-04	1.87E-04	2.54E-04	2.79E-04	2.54E-04	4.72E-02	1.38E-01
	ML-5-3	9.00	2.71	7.75	10.25	2.50	sand and clay	SC-3	0.56	3.77	0.06	0.00	06-Mar-09	200	200	4,200	720	200	15,000	29,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.42E-05	4.32E-05	1.23E-03	2.11E-04	5.86E-05	6.81E-03	2.89E-02
	ML-5-4	11.50	2.71	10.25	12.75	2.50	sand	SC-3	0.28	1.90	0.00	0.00	07-Mar-09	25	25	13,000	120	25	4,900	20,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13E-08	2.69E-08	1.90E-05	1.75E-07	3.65E-08	1.11E-05	9.92E-05
	ML-5-5	14.00	2.71	12.75	15.25	2.50	sand	SC-3	0.28	1.90	0.28	0.00	07-Mar-09	200	200	25,000	200	200	10,000	980	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.71E-04	2.15E-04	3.65E-02	2.92E-04	2.92E-04	2.26E-02	4.86E-03
	ML-5-6	16.50	2.71	15.25	17.75	2.50	sand	SC-3	0.28	1.90	0.28	0.00	07-Mar-09	50	50	8,300	76	50	7,900	2,200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.26E-05	5.38E-05	1.21E-02	1.11E-04	7.29E-05	1.79E-02	6.93E-03
	ML-5-7	19.00	2.71	17.75	20.00	2.25	sand and peat	SC-3	0.78	4.76	0.16	0.00	07-Mar-09	3,400	680	1,400	25	25	2,100	4,400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45E-03	3.66E-04	1.02E-03	1.82E-05	1.82E-05	3.38E-03	1.09E-02
	ML-6-2	6.50	2.90	3.40	7.75	4.35	sand	SC-8	0.28	3.54	0.28	0.00	10-Mar-09	10	10	33	30	10	980	4000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59E-05	2.00E-05	8.96E-05	8.15E-05	2.72E-05	4.13E-03	3.70E-02
	ML-6-3	9.00	2.90	7.75	10.25	2.50	sand and clay	SC-8	0.59	4.28	0.03	0.00	10-Mar-09	100	100	14,000	910	100	12,000	34,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.21E-06	1.16E-05	2.20E-03	1.43E-04	1.57E-05	2.93E-03	1.82E-02
	ML-6-4	11.50	2.90	10.25	12.75	2.50	sand and clay	SC-8	0.52	3.78	0.09	0.00	11-Mar-09	80	80	10,000	110	80	5,500	23,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.19E-05	2.77E-05	4.69E-03	5.16E-05	3.75E-05	4.00E-03	3.67E-02
	ML-6-5	14.00	2.90	12.75	15.25	2.50	sand	SC-8	0.28	2.04	0.28	0.00	11-Mar-09	500	500	72,000	500	500	6,900	1,600	0.00	0.00	0.01	0.00	0.00	0.00	0.00	4.56E-04	5.70E-04	1.12E-01	7.80E-04	7.80E-04	1.67E-02	8.49E-03
	ML-6-6	16.50	2.90	15.25	17.75	2.50	sand	SC-8	0.28	2.04	0.28	0.00	11-Mar-09	250	250	28,000	250	250	19,000	7,400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.28E-04	2.88E-04	4.37E-02	3.90E-04	3.90E-04	4.60E-02	3.93E-02
	ML-6-7	19.00	2.90	17.75	20.00	2.25	sand and peat	SC-8	0.78	5.10	0.16	0.00	11-Mar-09	2,300	1,100	6,900	70	50	9,300	8,900	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05E-03	6.33E-04	5.38E-03	5.46E-05	3.90E-05	1.13E-02	2.36E-02

Notes:
ft bgs - feet below ground surface
ft - feet
ft/d - feet per day
ft² - square foot
µg/L - micrograms per liter
g/d - grams per day
mmol/day - millimoles per day
Bold indicates detected parameter; non-bold is quantitation limit

TABLE E-45: SUMMARY OF POST-DEMONSTRATION MASS FLUX ESTIMATES FOR PNEUMATIC INJECTION TEST PLOT - 3 WELLS
Parris Island, South Carolina

Geosyntec Consultants

	Units	PCE	TCE	cDCE	tDCE	1,1-DCE	VC	Ethene	Units	PCE	TCE	cDCE	tDCE	1,1-DCE	VC	Ethene
<i>Pre-Injection Flux</i>																
Upgradient	g/d	0.12	0.02	0.14	0.00	0.00	0.01	0.00	mmol/d	0.71	0.17	1.39	0.02	0.01	0.11	0.04
Downgradient	g/d	0.01	0.00	0.09	0.00	0.00	0.00	0.00	mmol/d	0.04	0.02	0.89	0.02	0.00	0.06	0.01
<i>Post-Injection Flux</i>																
Upgradient	g/d	0.14	0.02	0.11	0.00	0.00	0.03	0.01	mmol/d	0.87	0.15	1.15	0.03	0.02	0.54	0.42
Downgradient	g/d	0.00	0.00	0.02	0.00	0.00	0.01	0.01	mmol/d	0.00	0.00	0.22	0.00	0.00	0.19	0.39
<i>Mass Flux Reduction</i>																
Pre-injection	g/d	94.2%	89.8%	36.3%	0.2%	60.1%	41.8%	78.0%								
Post-injection	g/d	99.6%	98.3%	80.5%	89.5%	89.6%	64.2%	7.7%								

Notes:

g/d - grams per day

Treatment depth 20 ft

Treatment width¹ 8.83 ft

Normalized area 146.6 ft²

<i>Pre-Injection Flux</i>																
Upgradient	mg/yr/ft ²	292.96	54.77	336.23	3.94	2.31	17.18	2.64	mmol/yr/ft ²	1,766.62	416.86	3,468.47	40.66	23.84	274.92	92.57
Downgradient	mg/yr/ft ²	16.96	5.58	214.23	3.93	0.92	10.00	0.58	mmol/yr/ft ²	102.27	42.45	2,209.94	40.56	9.52	160.03	20.38
<i>Post-Injection Flux</i>																
Upgradient	mg/yr/ft ²	358.22	48.49	278.45	6.55	4.69	84.53	29.66	mmol/yr/ft ²	2,160.14	369.03	2,872.39	67.56	48.42	1,352.48	1,040.77
Downgradient	mg/yr/ft ²	1.51	0.83	54.19	0.69	0.49	30.28	27.39	mmol/yr/ft ²	9.09	6.32	559.00	7.08	5.05	484.45	961.02

Notes:

g/d - grams per day

mmol/day - millimols per day

ft bgs - feet below ground surface

ft² - square foot

mg/yr/ft² - milligrams per year per square foot

mmol/yr/ft² - millimols per year per square foot

1 - treatment width calculated as sum of following assumed effective cross sectional areas (perpendicular to groundwater flow) for each multilevel well; ML-4, 3.22 ft; ML-5, 2.71 ft; ML-6, 2.90 ft

TABLE E-46: CALCULATION OF PRE-INJECTION MASS FLUX ESTIMATES FOR PNEUMATIC INJECTION TEST PLOT - INTEGRAL PUMP TEST
Parris Island, South Carolina

Geosyntec Consultants

Parameter	Symbol	Units	Value												
Flow	Q	gpm	1.25	average flow during IPT											
		ft ³ /min	0.167												
Aquifer thickness	b	ft	16.6	water table at 3.4 ft bgs (measured before pump test); assume bottom of aquifer at 20 ft bgs (at clay aquitard)											
Effective porosity	n_e		0.410	weighted porosity for PMW-3 screened interval (porosities from SC-9 results)											
Hydraulic conductivity	k	ft/d	15.3	from RI/RFI for site /SWMU45 (Tetra Tech NUS, 2004a); pump test results from Oct 2001											
		ft/min	0.010625												
Hydraulic gradient	∇h	ft/ft	0.0026	from RI/RFI for site /SWMU45 (Tetra Tech NUS, 2004a); median of Nov 2001 gradients											

Parameter	increment	time	capture zone radius	streamtube width	streamtube flowrate	PCE		TCE		cis-1,2-DCE		VC		Ethene	
						conc at pumping well	avg conc for time ti	conc at pumping well	avg conc for time ti	conc at pumping well	avg conc for time ti	conc at pumping well	avg conc for time ti	conc at pumping well	avg conc for time ti
Symbol	i	t	$r(t)$	Δr_i	Q_i	C_{p_i}	C_{x_i}	C_{p_i}	C_{x_i}	C_{p_i}	C_{x_i}	C_{p_i}	C_{x_i}	C_{p_i}	C_{x_i}
Units	--	(min)	(ft)	(ft)	gpm	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	1	15	0.342273072	0.342273072	0.000156958	26000	26000.0	12000	12000.0	28000	28000.0	2000	2000.0	78	78.0
	2	30	0.48404722	0.141774148	6.50141E-05	19000	12000.0	8900	5800.0	19000	10000.0	1300	600.0	79	80.0
	3	60	0.684546143	0.200498923	9.19438E-05	20000	18666.7	9200	8466.7	17000	12000.0	1200	866.7	78	77.3
	4	120	0.96809444	0.283548297	0.000130028	20000	19336.3	8900	8258.4	15000	11051.4	1200	1067.0	79	79.8
	5	240	1.369092286	0.400997847	0.000183888	19000	17673.4	8800	8435.0	14000	11445.4	1000	738.9	67	55.3
	6	480	1.93618888	0.567096593	0.000260056	20000	20503.2	8500	8042.0	13000	10951.4	1100	1103.6	79	87.1
	7	720	2.3713374	0.435148521	0.000199548	19000	17611.0	7900	6739.8	10000	4279.1	870	502.9	78	79.7
	8	960	2.738184573	0.366847173	0.000168227	19000	18356.7	7400	5816.6	10000	7123.8	850	633.5	84	97.2

Mass Flux [MF]				
PCE	TCE	cis-1,2-DCE	VC	Ethene
g/d	g/d	g/d	g/d	g/d
0.3328	0.1536	0.3584	0.0256	0.0010
0.0636	0.0308	0.0530	0.0032	0.0004
0.1400	0.0635	0.0900	0.0065	0.0006
0.2050	0.0876	0.1172	0.0113	0.0008
0.2650	0.1265	0.1716	0.0111	0.0008
0.4348	0.1706	0.2323	0.0234	0.0018
0.2866	0.1097	0.0696	0.0082	0.0013
0.2518	0.0798	0.0977	0.0087	0.0013
Total	1.98	0.82	1.19	0.10

Normalized area ¹	90.9	ft ²			
Mass flux (mg/yr/ft ²)	7948.84	3300.16	4777.40	393.30	32.74
Mass flux (mmol/yr/ft ²)	47.93	25.12	49.28	6.29	1.15

PMW-3 Screened Interval Porosity Calculation ²		
Soil Type	Thickness (ft)	Weighted Porosity
sand	10	0.187
clay	4	0.167
peat	1	0.056
	15	0.410

$$r(t) = \sqrt{\frac{Qt}{\pi b n_e}}$$

$$\Delta r_i = \sqrt{\frac{Q}{\pi n_e b}} (\sqrt{t_i} - \sqrt{t_{i-1}})$$

$$Q_i = k \nabla h b \Delta r$$

$$C_{x_i} = \frac{\pi C_{p_i}}{2 \arccos\left(\frac{r(t_{i-1})}{r(t_i)}\right)} - \frac{\sum_{k=1}^{i-1} C_{x_k} \left[\arccos\left(\frac{r(t_{k-1})}{r(t_i)}\right) - \arccos\left(\frac{r(t_k)}{r(t_i)}\right) \right]}{\arccos\left(\frac{r(t_{i-1})}{r(t_i)}\right)}$$

$$MF = 2 \sum_{i=1}^N Q_i C_{x_i} \quad \text{where } N = \text{number of data points (8)}$$

Notes:

gpm - gallons per minute
ft³/min - cubic feet per minute
ft - feet
ft bgs - feet below ground surface
ft/d - feet per day
ft/min - feet per minute
min - minute
mmol/day - millimols per day
µg/L - micrograms per liter
g/d - grams per day
ft² - square foot
mg/yr/ft² - milligrams per year per square foot
mmol/yr/ft² - millimols per year per square foot

¹ - normalized area calculated as capture zone width multiplied by aquifer thickness

² - PMW-3 screened interval porosity calculated using porosity values from SC-9 soil types

TABLE E-47: CALCULATION OF POST-DEMONSTRATION MASS FLUX ESTIMATES FOR PNEUMATIC INJECTION TEST PLOT - INTEGRAL PUMP TEST
Parris Island, South Carolina

Geosyntec Consultants

Parameter	Symbol	Units	Value	
Flow	Q	gpm	1	average flow during IPT
		ft ³ /min	0.134	
Aquifer thickness	b	ft	16.6	water table assumed to be at 3.4 ft bgs (same as baseline IPT); assume bottom of aquifer at 20 ft bgs (at clay aquitard)
Effective porosity	n_e		0.410	weighted porosity for PMW-3 screened interval (porosities from SC-9 results)
Hydraulic conductivity	k	ft/d	15.3	from RI/RFI for site /SWMU45 (Tetra Tech NUS, 2004a); pump test results from Oct 2001
		ft/min	0.011	
Hydraulic gradient	∇h	ft/ft	0.0026	from RI/RFI for site /SWMU45 (Tetra Tech NUS, 2004a); median of Nov 2001 gradients

Parameter	increment	time	capture zone radius	streamtube width	streamtube flowrate	PCE		TCE		cis-1,2-DCE		VC		Ethene	
Symbol	i	t	$r(t)$	Δr_i	Q_i	conc at pumping well	avg conc for time ti	conc at pumping well	avg conc for time ti	conc at pumping well	avg conc for time ti	conc at pumping well	avg conc for time ti	conc at pumping well	avg conc for time ti
Units	--	(min)	(ft)	(ft)	gpm	C_{p_i}	Cx_i	C_{p_i}	Cx_i	C_{p_i}	Cx_i	C_{p_i}	Cx_i	C_{p_i}	Cx_i
						μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L
	1	15	0.306138342	0.306138342	0.000140387	880	880.0	940	940.0	13000	13000.0	5000	5000.0	1400	1400.0
	2	30	0.432944995	0.126806653	5.81504E-05	790	700.0	810	680.0	14000	15000.0	4200	3400.0	1400	1400.0
	3	60	0.612276684	0.179331689	8.2237E-05	570	320.0	640	426.7	15000	16333.3	3900	3333.3	1300	1200.0
	4	120	0.86588999	0.253613306	0.000116301	380	103.8	490	264.8	14000	13475.8	3100	2086.1	1300	1266.7
	5	240	1.224553368	0.358663378	0.000164474	260	39.3	350	127.1	15000	15876.1	3100	2737.0	1300	1285.8
	6	480	1.731779981	0.507226613	0.000232601	220	95.2	300	166.3	19000	23290.8	3700	4139.6	1400	1493.3
	7	720	2.12098865	0.389208669	0.000178481	180	51.3	230	51.2	23000	31159.8	3000	2086.3	1500	1695.9
	8	960	2.449106736	0.328118086	0.000150467	160	46.5	220	102.8	24000	30107.5	3100	2891.8	1400	1297.1

Mass Flux [MF]				
PCE	TCE	cis-1,2-DCE	VC	Ethene
g/d	g/d	g/d	g/d	g/d
0.0101	0.0108	0.1488	0.0572	0.0160
0.0033	0.0032	0.0711	0.0161	0.0066
0.0021	0.0029	0.1095	0.0224	0.0080
0.0010	0.0025	0.1278	0.0198	0.0120
0.0005	0.0017	0.2130	0.0367	0.0172
0.0018	0.0032	0.4418	0.0785	0.0283
0.0007	0.0007	0.4535	0.0304	0.0247
0.0006	0.0013	0.3694	0.0355	0.0159
Total	0.02	0.03	1.94	0.30

Normalized area ¹	81.3	ft ²		
Mass flux (mg/yr/ft ²)	90.57	117.73	8686.53	1331.42
Mass flux (mmol/yr/ft ²)	0.55	0.90	89.61	21.30

PMW-3 Screened Interval Porosity Calculation²

Soil Type	Thickness (ft)	Weighted Porosity
sand	10	0.187
clay	4	0.167
peat	1	0.056
	15	0.410

Notes:

gpm - gallons per minute
ft³/min - cubic feet per minute
ft - feet
ft bgs - feet below ground surface
ft/d - feet per day
ft/min - feet per minute
min - minute
mmol/day - millimols per day
μg/L - micrograms per liter
g/d - grams per day
ft² - square foot
mg/yr/ft² - milligrams per year per square foot
mmol/yr/ft² - millimols per year per square foot

¹ - normalized area calculated as capture zone width multiplied by aquifer thickness

² - PMW-3 screened interval porosity calculated using porosity values from SC-9 soil types

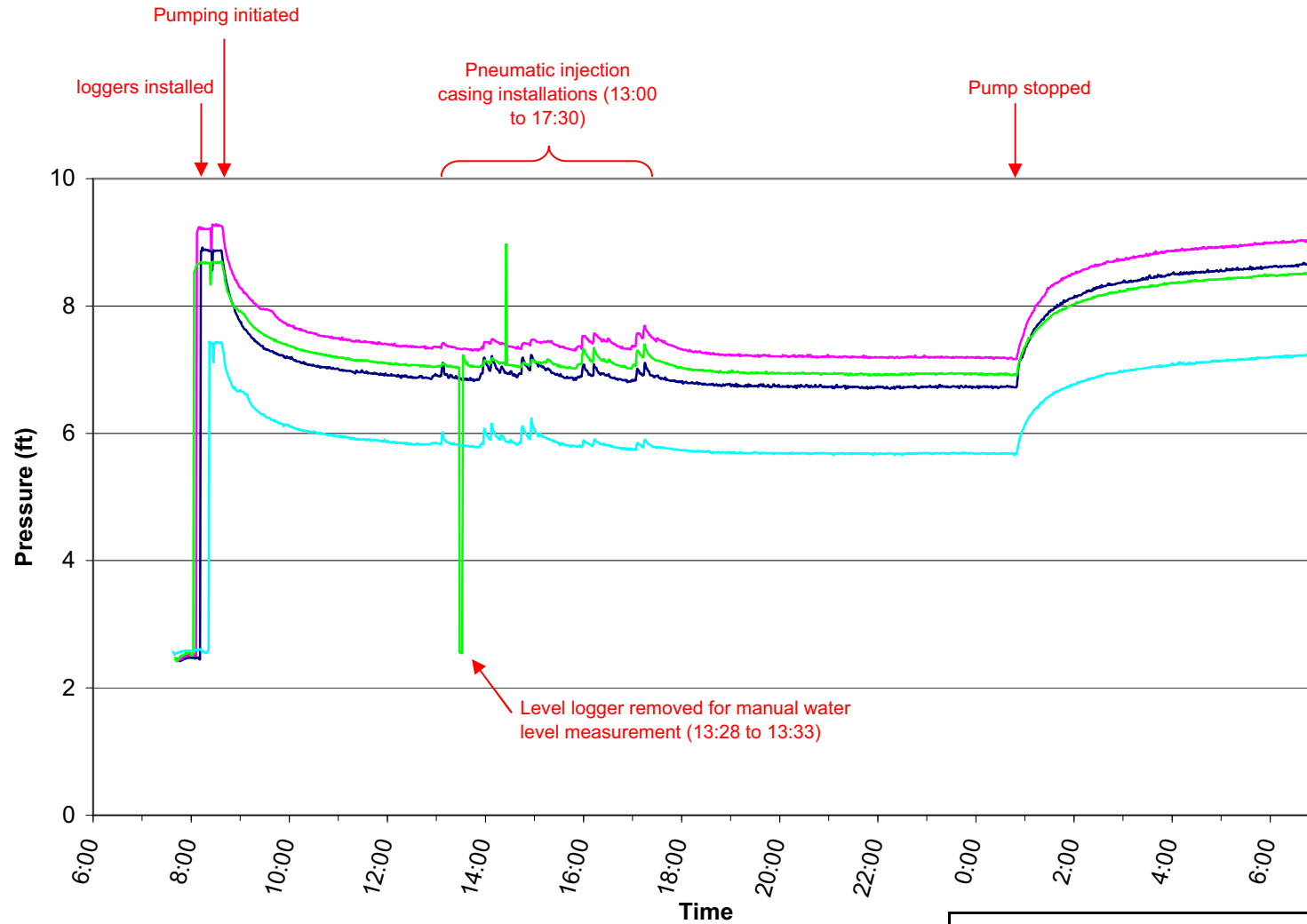
$$r(t) = \sqrt{\frac{Qt}{\pi b n_e}}$$

$$\Delta r_i = \sqrt{\frac{Q}{\pi n_e b}} (\sqrt{t_i} - \sqrt{t_{i-1}})$$

$$Q_i = k |\nabla h| b \Delta r$$

$$Cx_i = \frac{\pi C_{p_i}}{2 \arccos\left(\frac{r(t_{i-1})}{r(t_i)}\right)} - \frac{\sum_{k=1}^{i-1} Cx_k \left[\arccos\left(\frac{r(t_{k-1})}{r(t_i)}\right) - \arccos\left(\frac{r(t_k)}{r(t_i)}\right) \right]}{\arccos\left(\frac{r(t_{i-1})}{r(t_i)}\right)}$$

$$MF = 2 \sum_{i=1}^N Q_i Cx_i \quad \text{where } N = \text{number of data points (8)}$$



Down-Well Pressures During Pre-Injection IPT- Oct 12, 2006
Site 45, Parris Island MCRD, Parris Island, SC

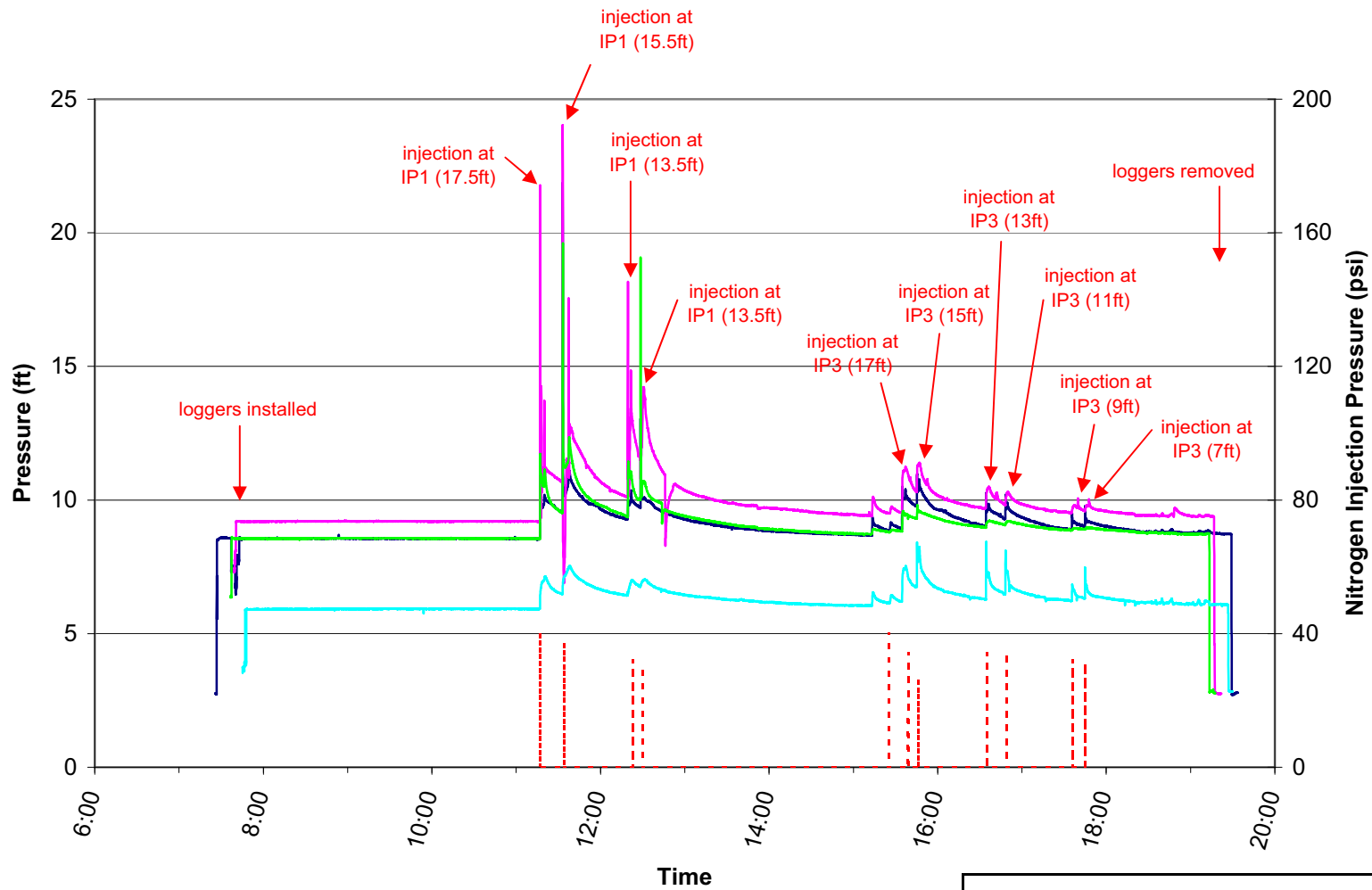
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Figure

E-1



Legend

- PMW-6
- PMW-5
- PMW-4
- PMW-2
- - - Nitrogen injection pressure

Down-Well and Nitrogen Injection Pressures - Oct 14, 2006
Site 45, Parris Island MCRD, Parris Island, SC

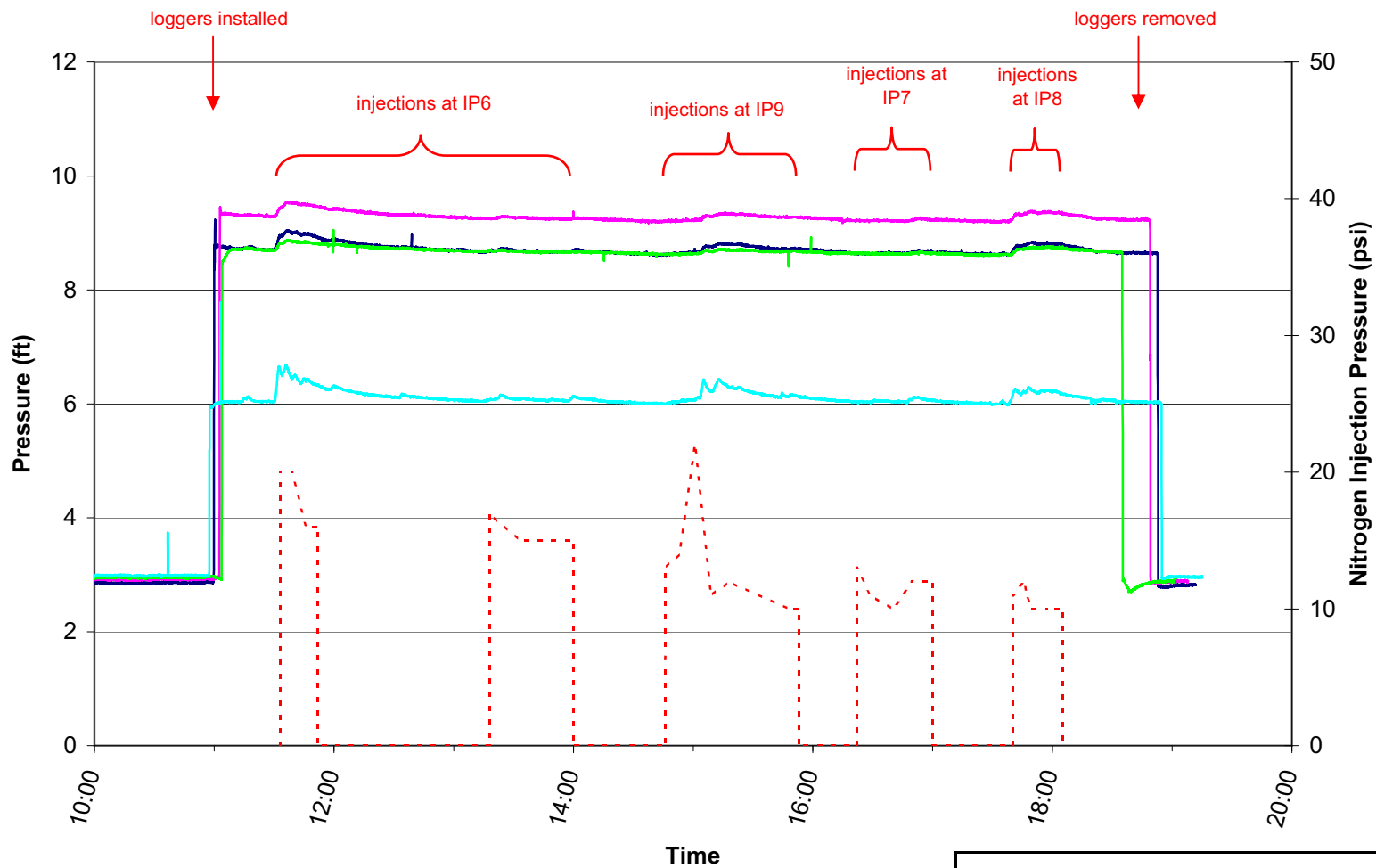
Geosyntec
consultants

Figure

E-2

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Legend

- PMW-6
- PMW-5
- PMW-4
- PMW-2
- - - Nitrogen Injection Pressure

Down-Well and Nitrogen Injection Pressures - Oct 15, 2006
Site 45, Parris Island MCRD, Parris Island, SC

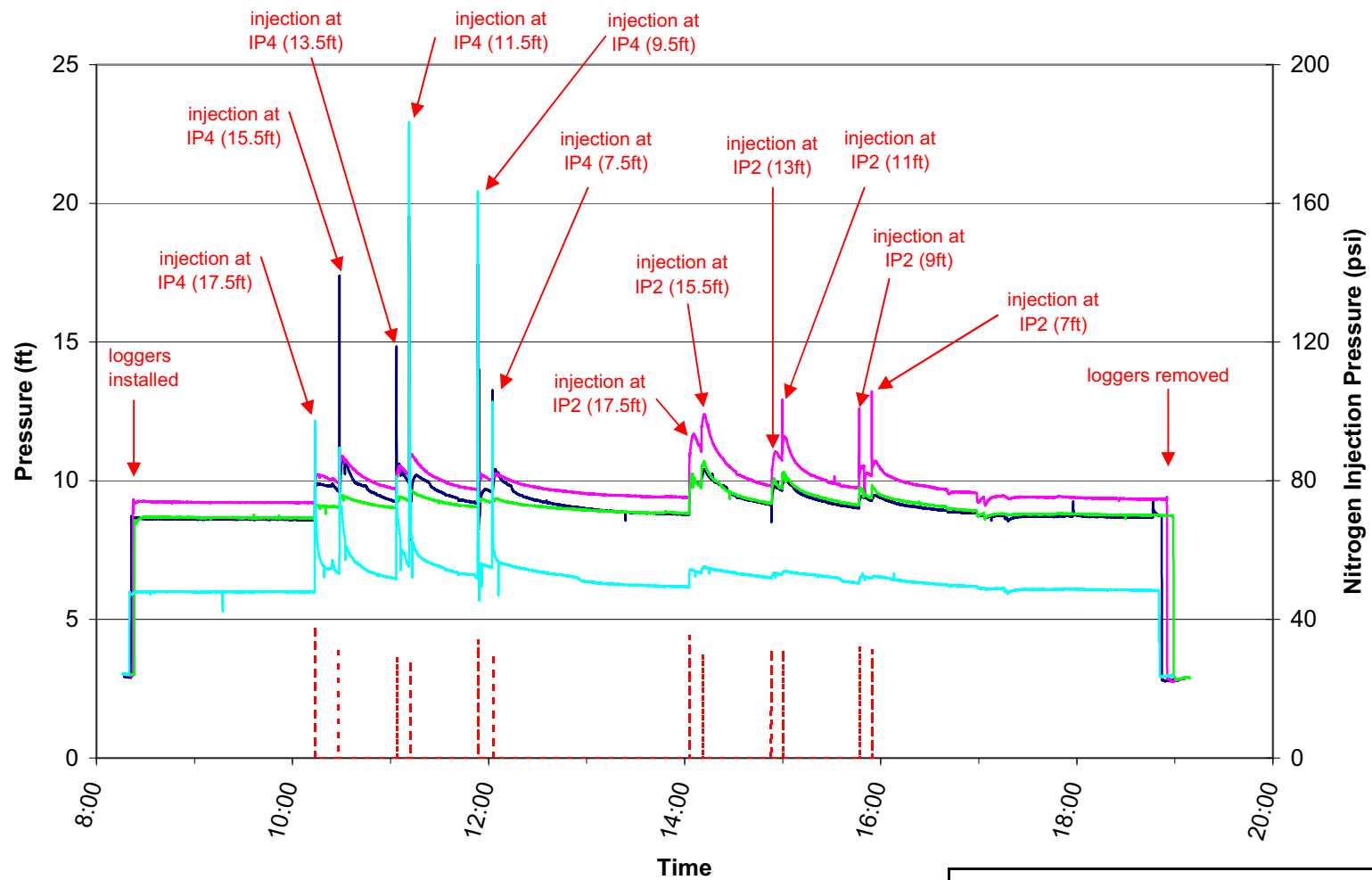
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Figure

E-3



Legend

- PMW-6
- PMW-5
- PMW-4
- PMW-2
- Nitrogen Injection Pressure

Down-Well and Nitrogen Injection Pressures - Oct 16, 2006
Site 45, Parris Island MCRD, Parris Island, SC

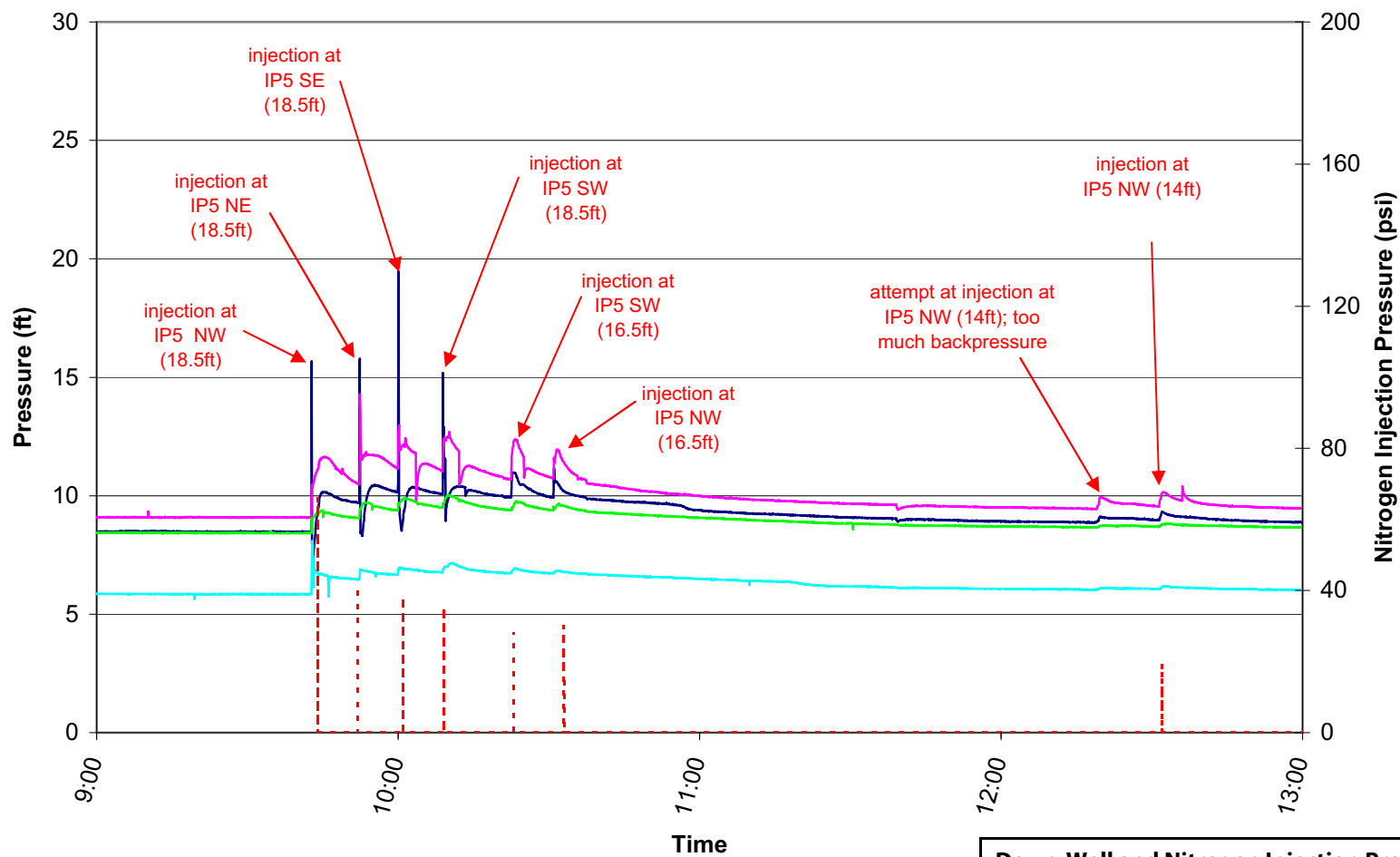
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Figure

E-4

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Legend

- PMW-6
- PMW-5
- PMW-4
- PMW-2
- - - Nitrogen injection pressure

**Down-Well and Nitrogen Injection Pressures - Oct 17, 2006
(09:00 - 13:00)**

Site 45, Parris Island MCRD, Parris Island, SC

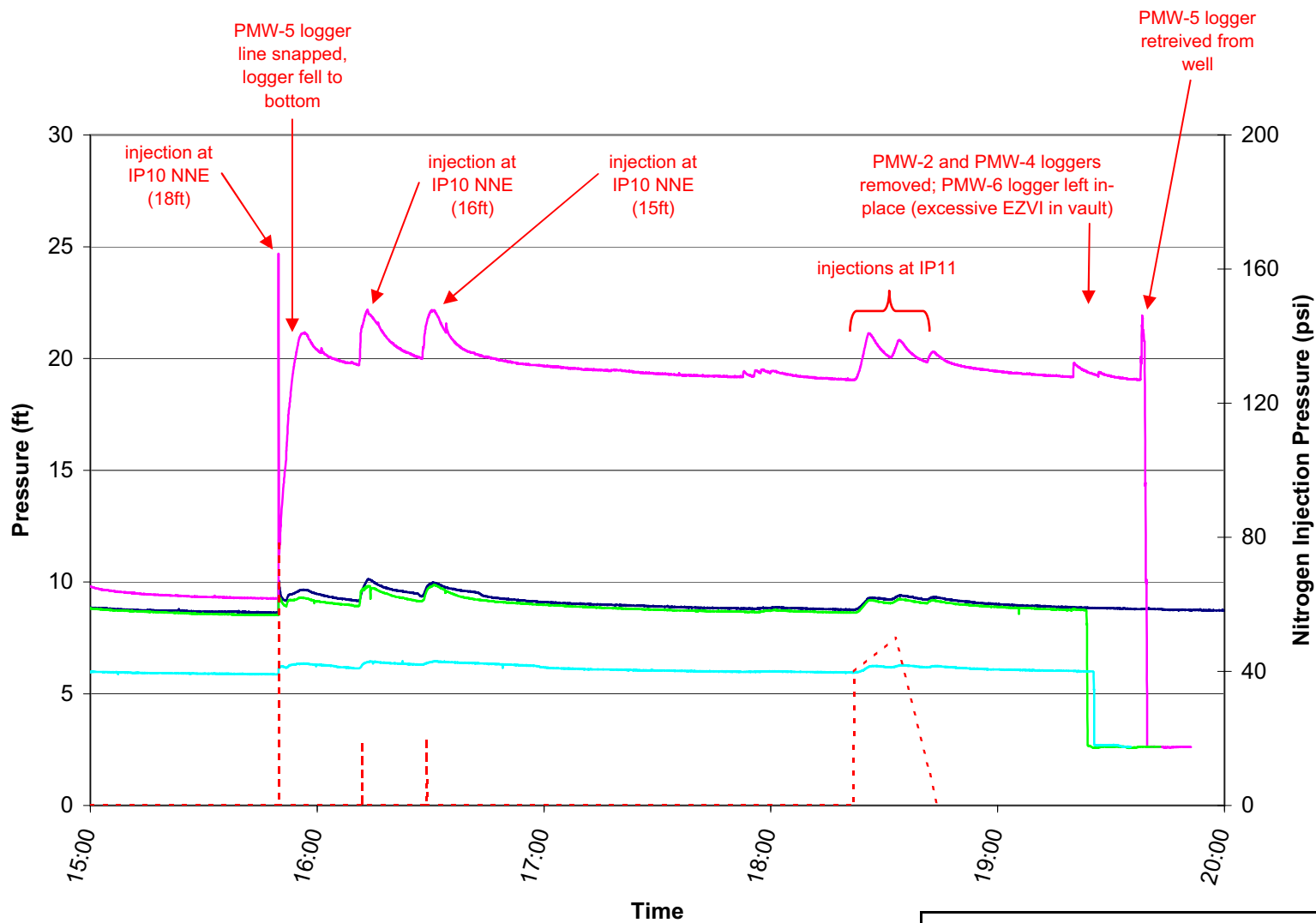
Geosyntec
consultants

Figure

E-5a

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Legend

- PMW-6
- PMW-5
- PMW-4
- PMW-2
- - - Nitrogen Injection Pressure

Down-Well and Nitrogen Injection Pressures - Oct 17, 2006 (15:00 - 20:00)

Site 45, Parris Island MCRD, Parris Island, SC

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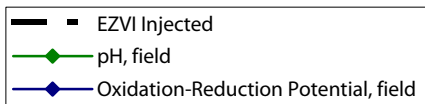
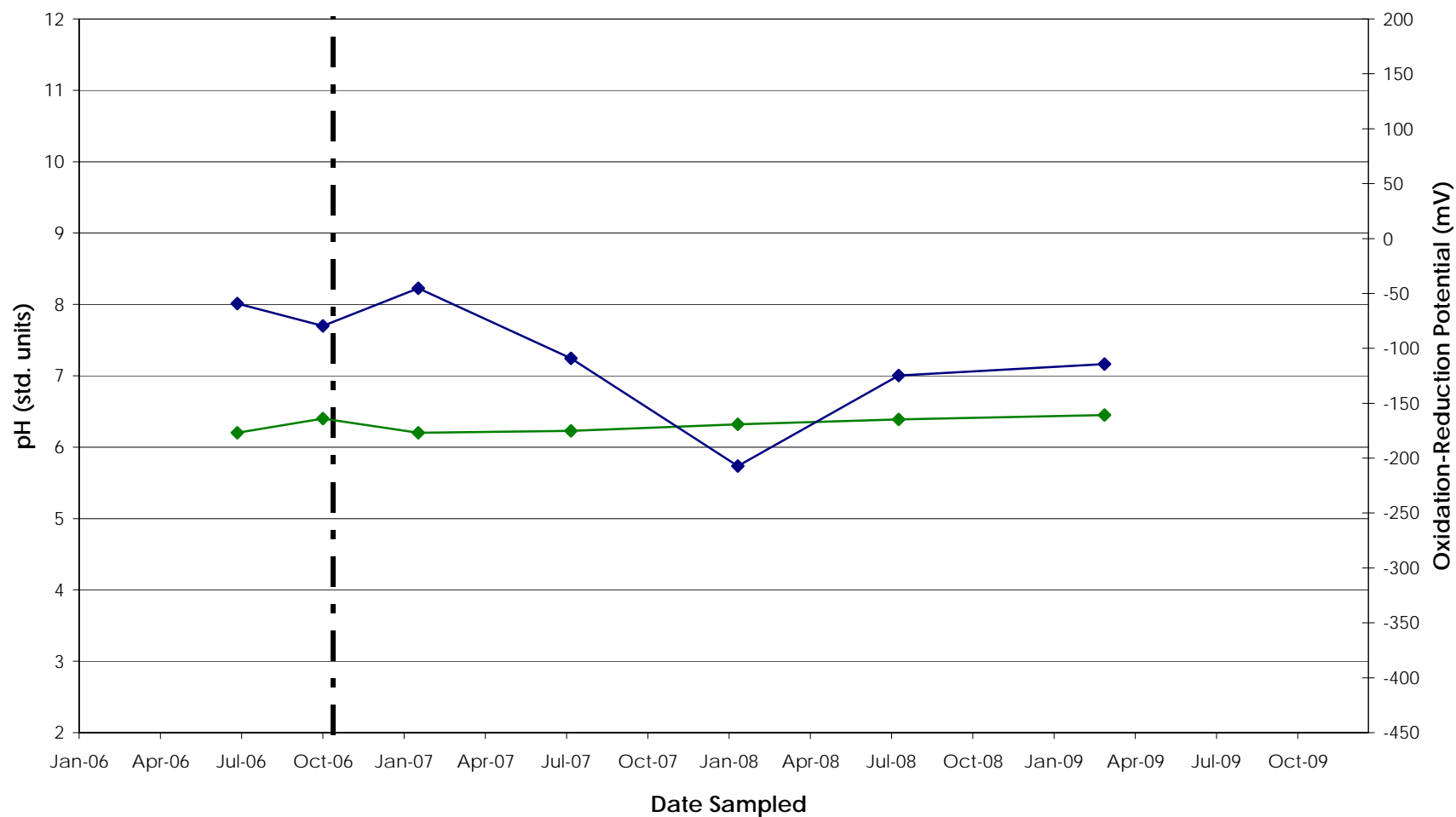
Figure

E-5b

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P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\GIS\Output\Plot_TrendPlot_20091113.k81\$START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at ML-1-2

Site 45, Parris Island MCRD, Parris Island, SC

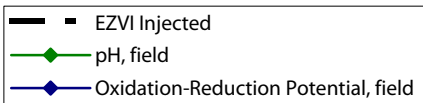
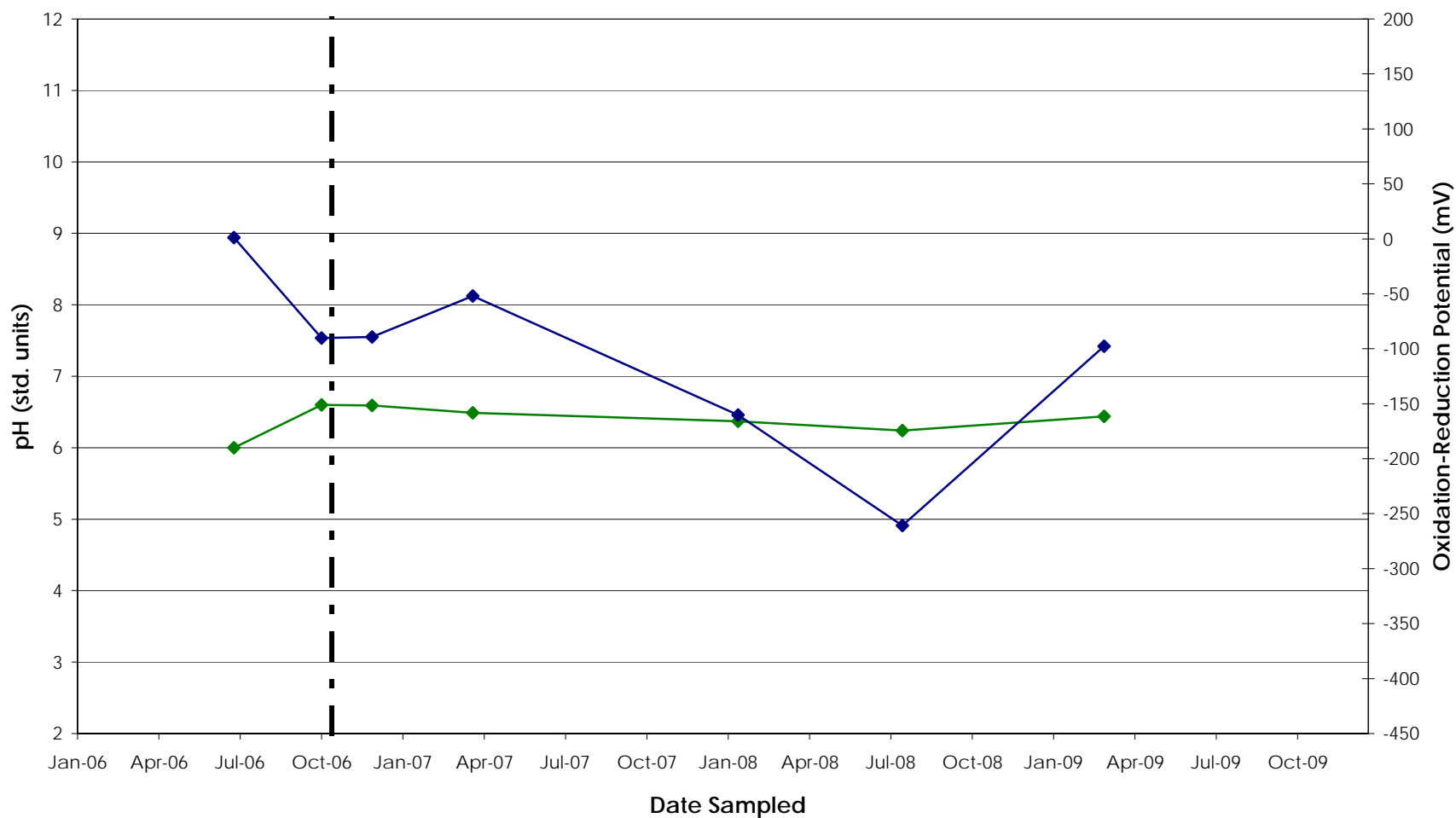
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Figure

E-6



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-1-3

Site 45, Parris Island MCRD, Parris Island, SC

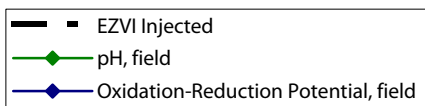
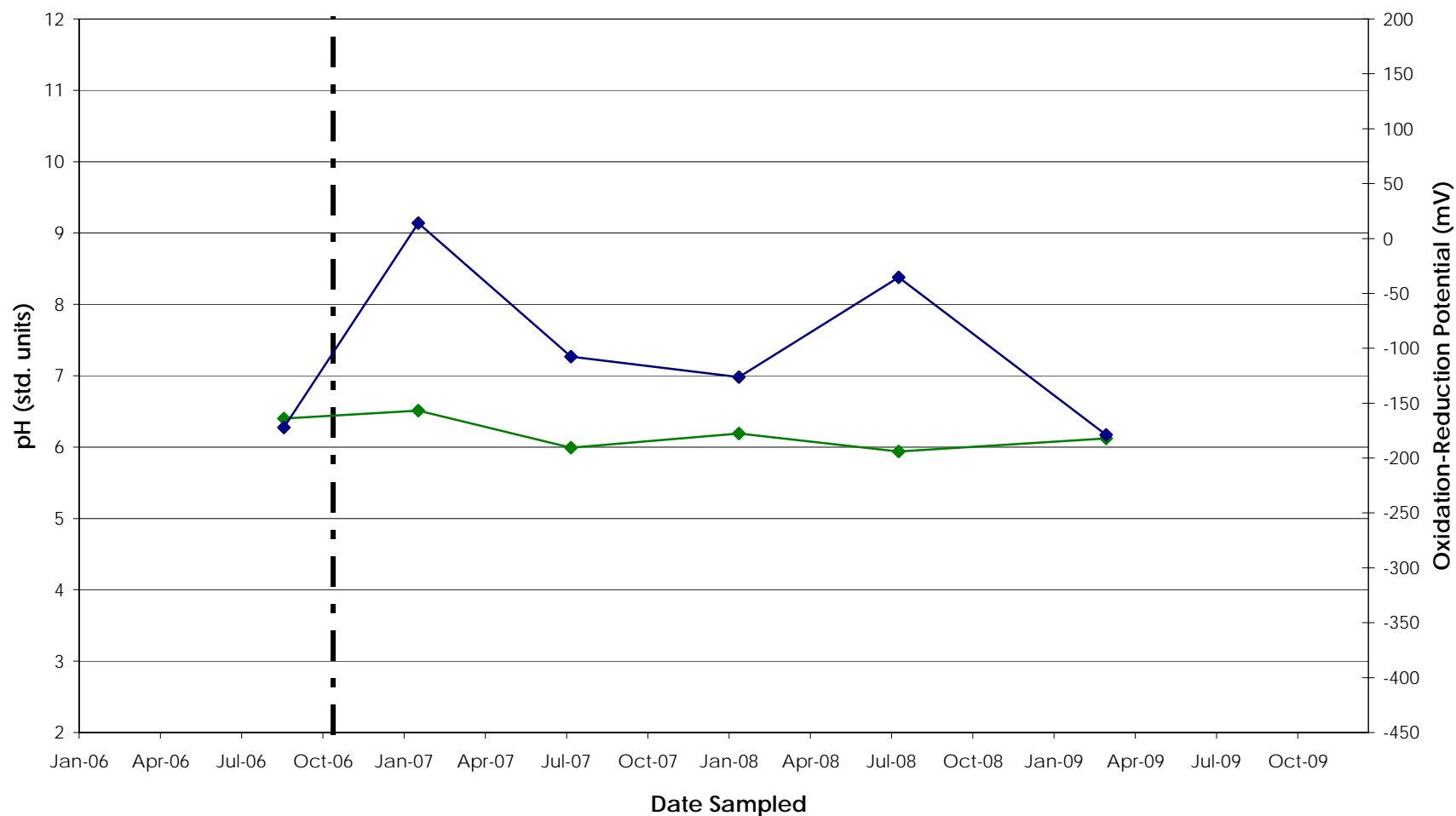
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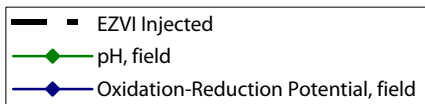
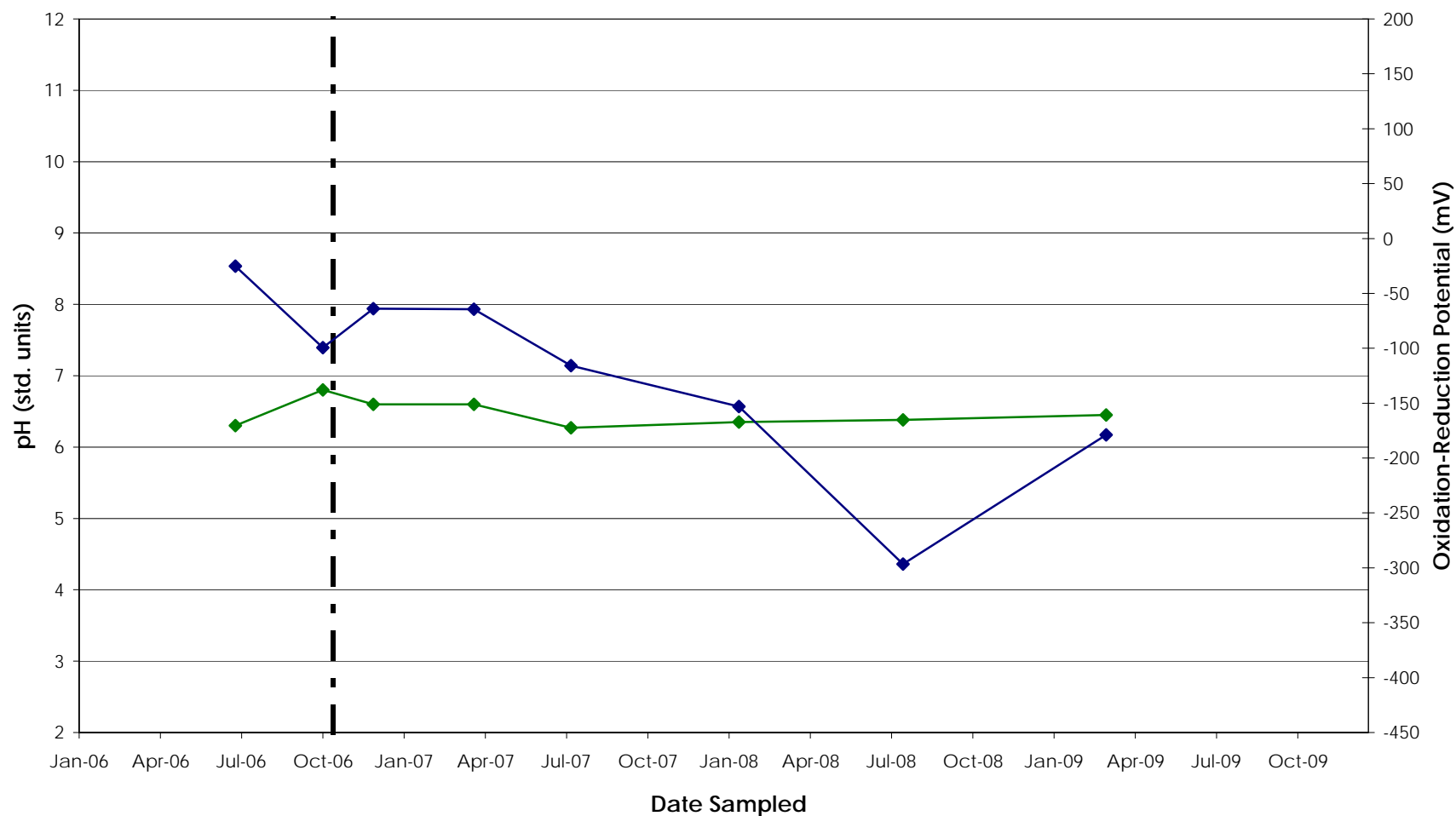
Figure

E-7



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-1-4 Site 45, Parris Island MCRD, Parris Island, SC		
		Figure
Guelph	November 2009	E-8



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-1-5

Site 45, Parris Island MCRD, Parris Island, SC

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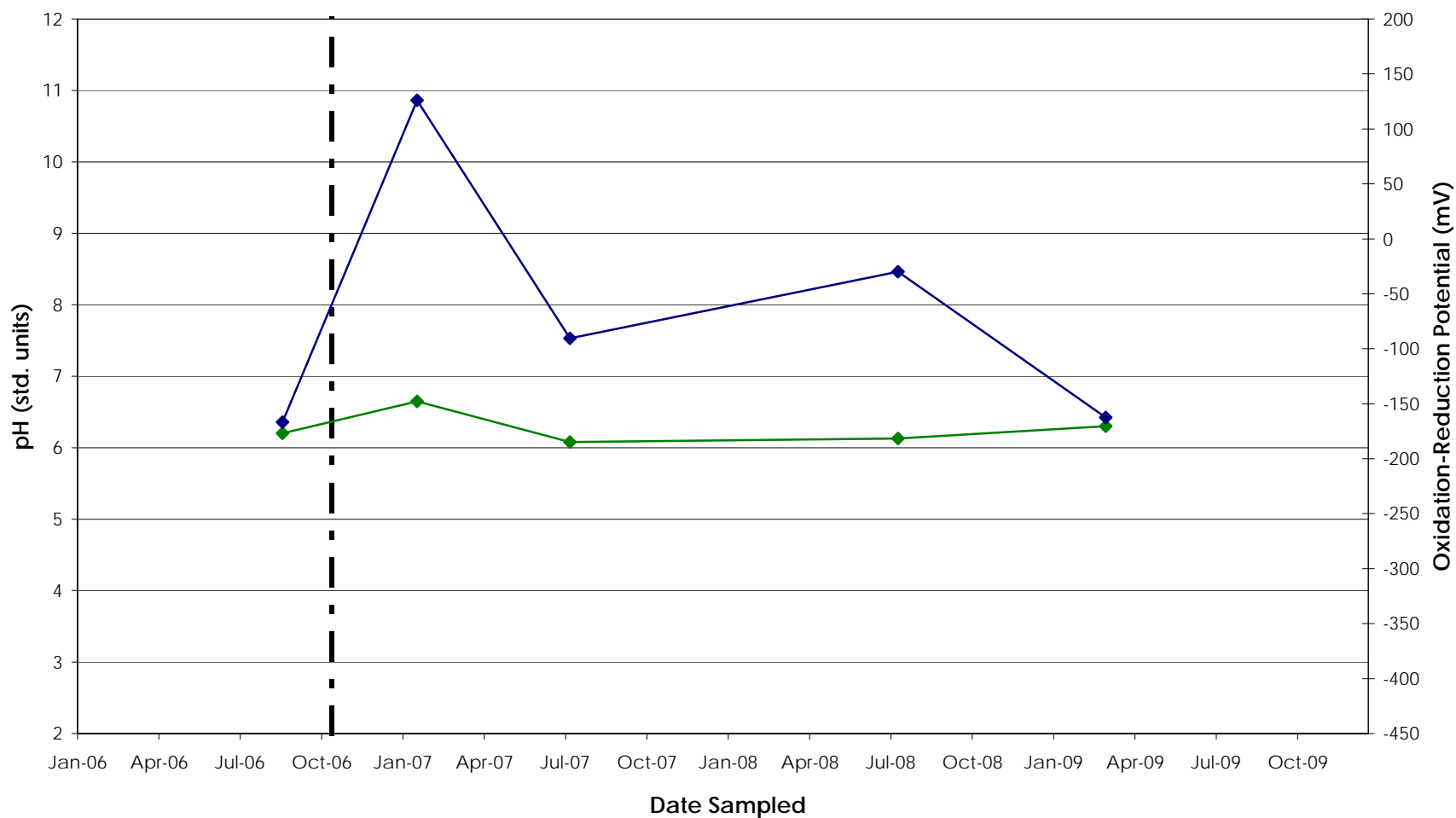
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Figure

E-9

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\GIS\Output\Plot_TrendPlot_20091113.k81START



ORP and pH Trends at ML-1-6

Site 45, Parris Island MCRD, Parris Island, SC

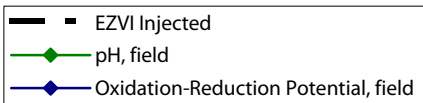
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Figure

E-10



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-1-7

Site 45, Parris Island MCRD, Parris Island, SC

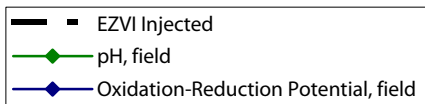
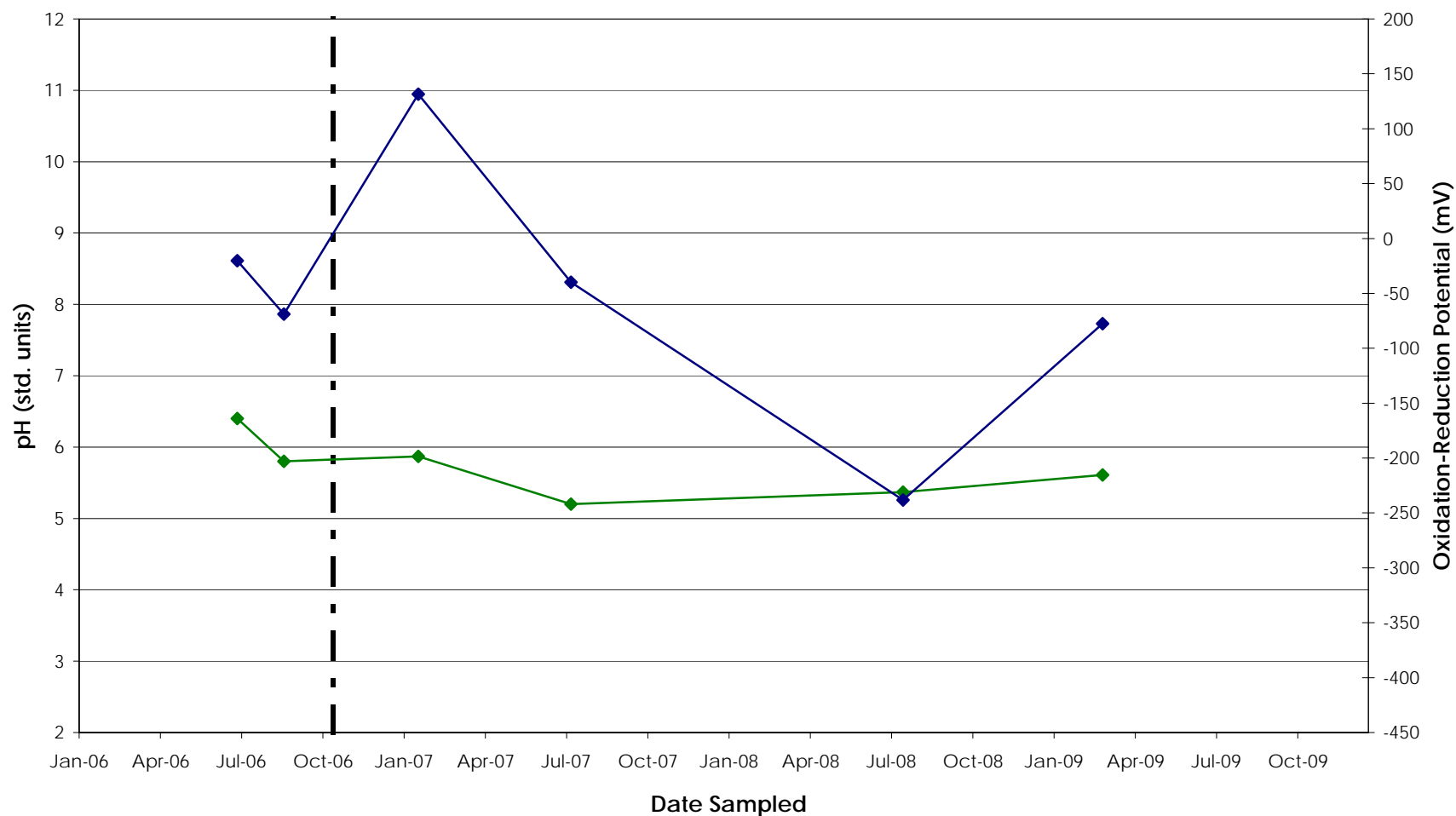
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Figure

E-11



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-2-2

Site 45, Parris Island MCRD, Parris Island, SC

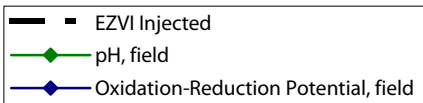
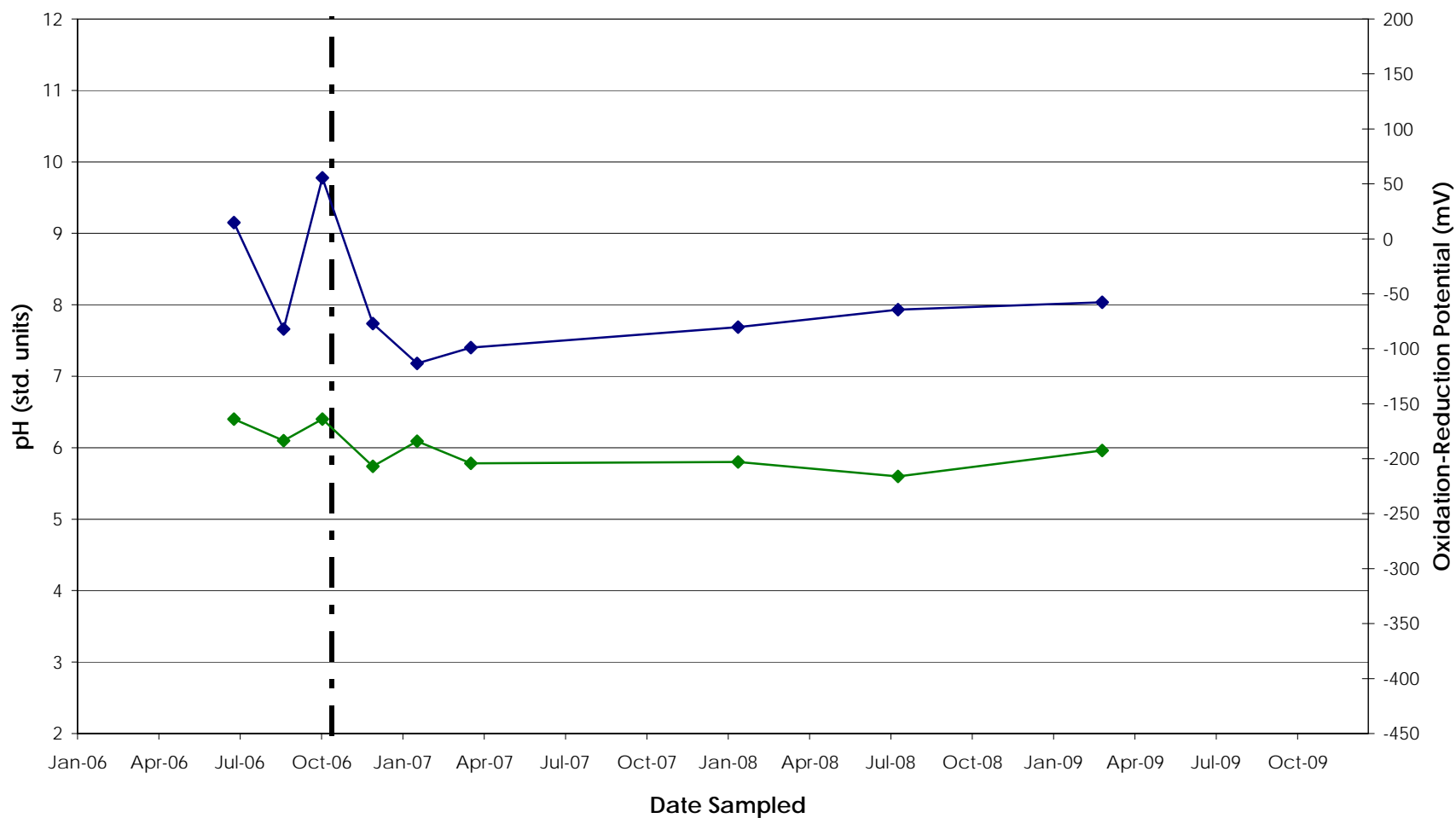
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Figure

E-12



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-2-3

Site 45, Parris Island MCRD, Parris Island, SC

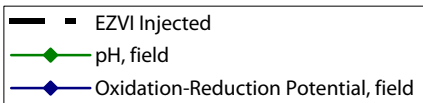
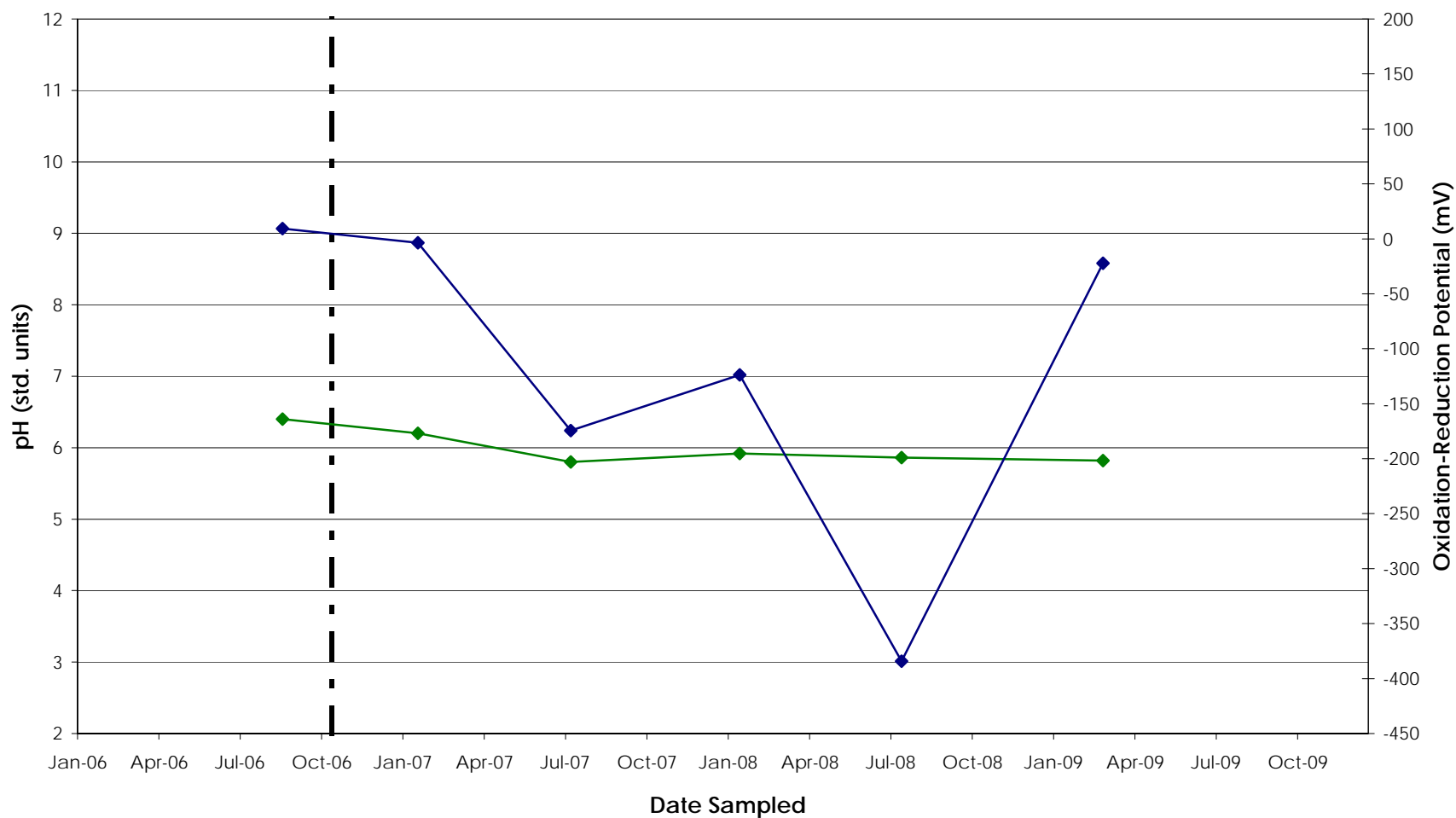
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Figure

E-13



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-2-4

Site 45, Parris Island MCRD, Parris Island, SC

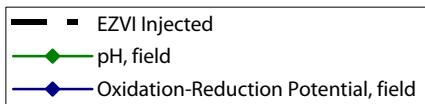
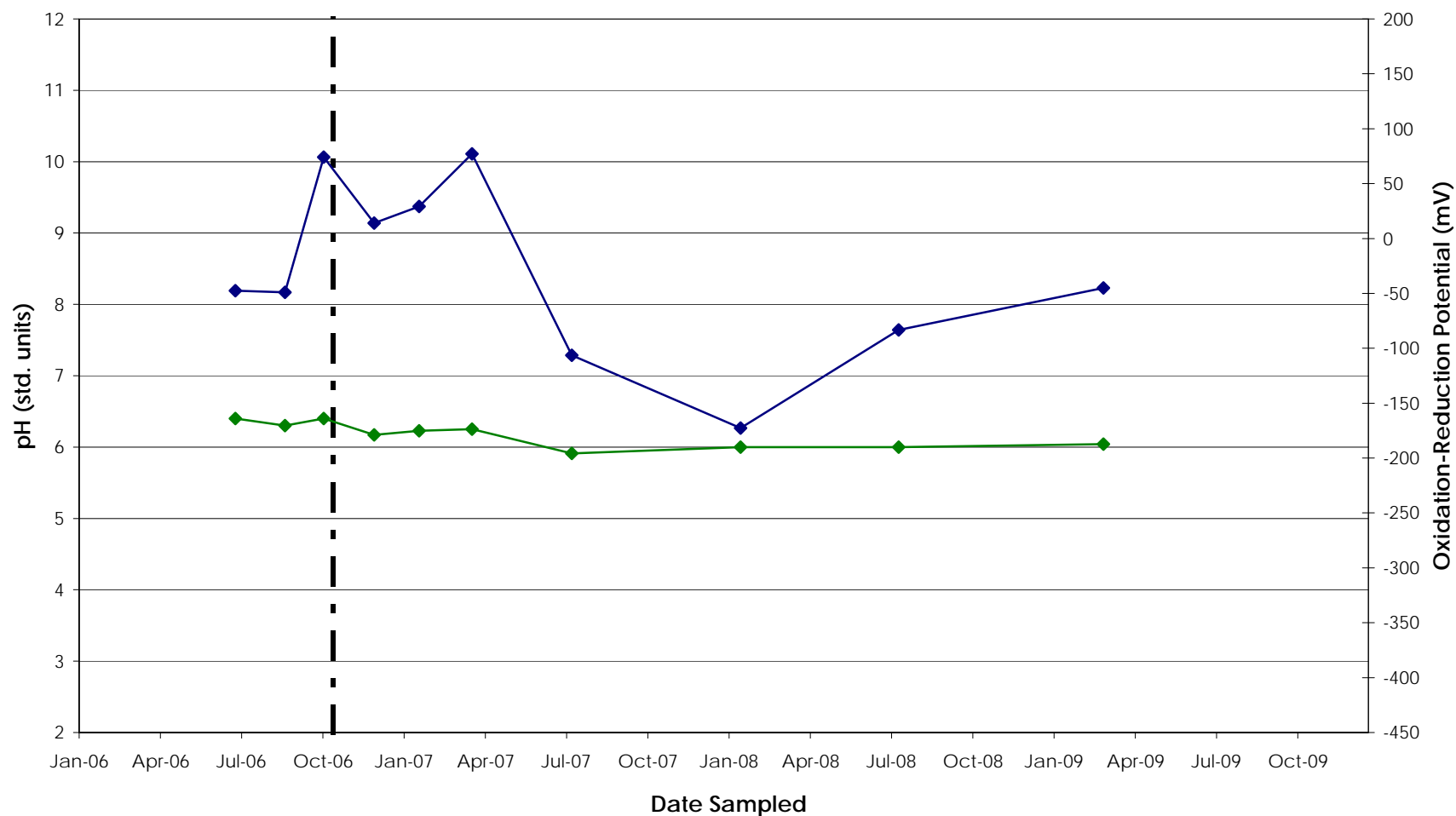
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Figure

E-14



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-2-5

Site 45, Parris Island MCRD, Parris Island, SC

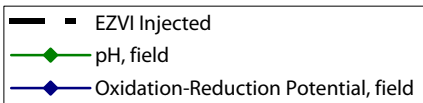
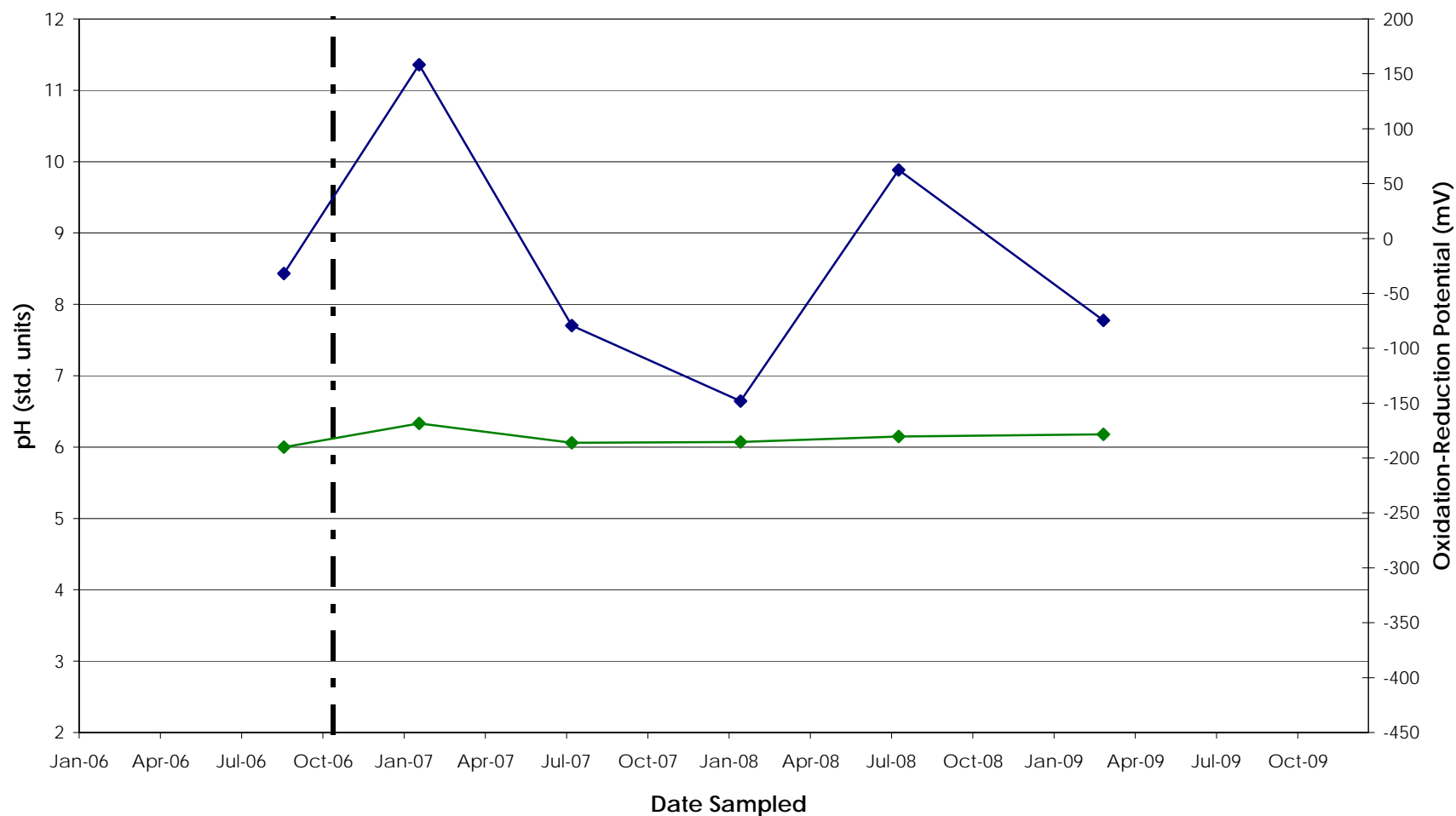
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Figure

E-15



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-2-6

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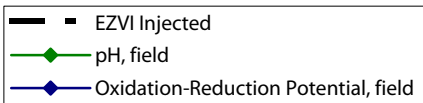
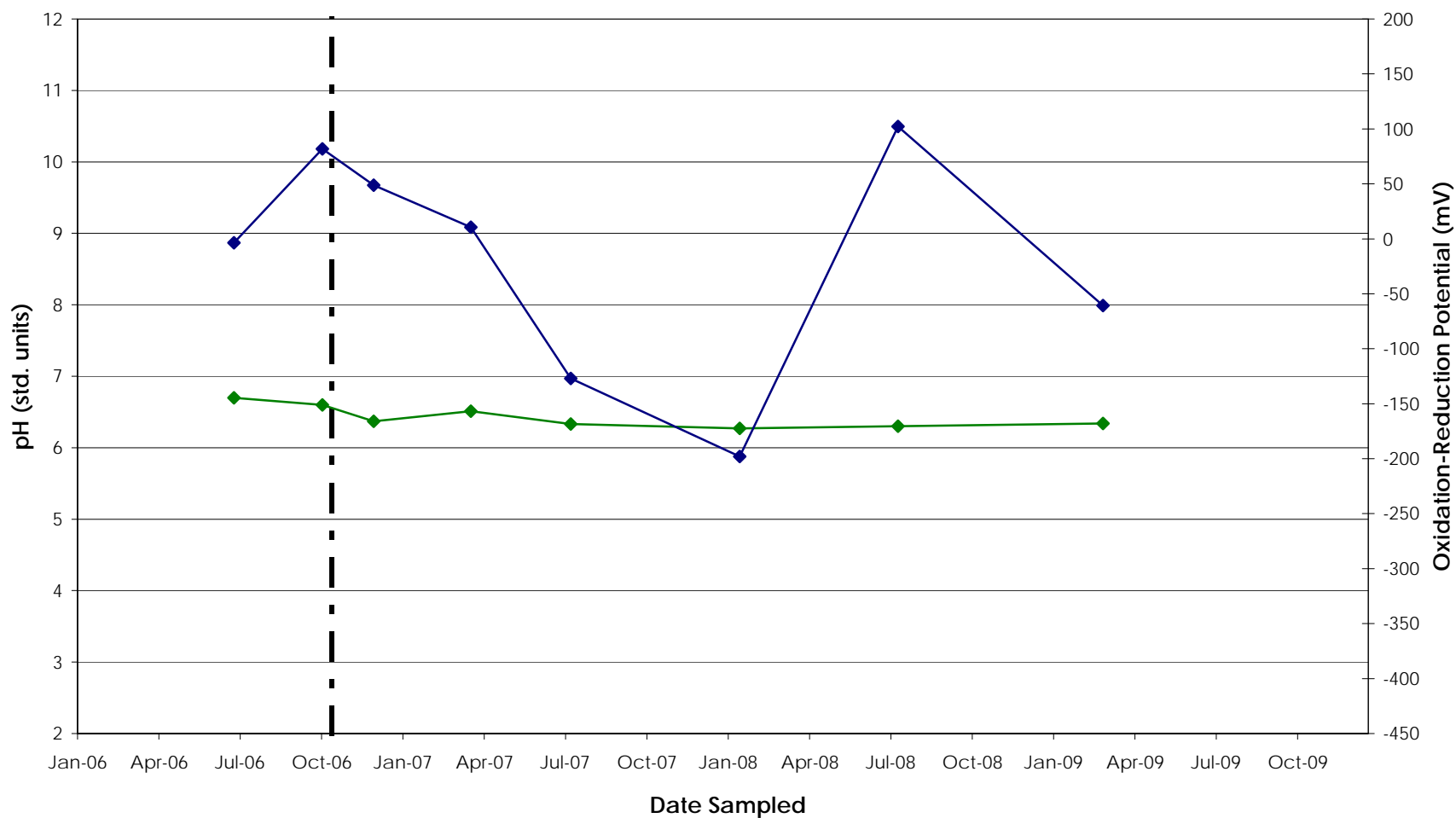
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Figure

E-16

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\GIS\Output\Plot_TrendPlot_20091113.xls\START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at ML-2-7

Site 45, Parris Island MCRD, Parris Island, SC

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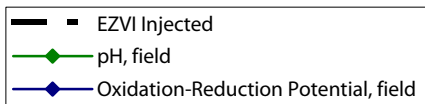
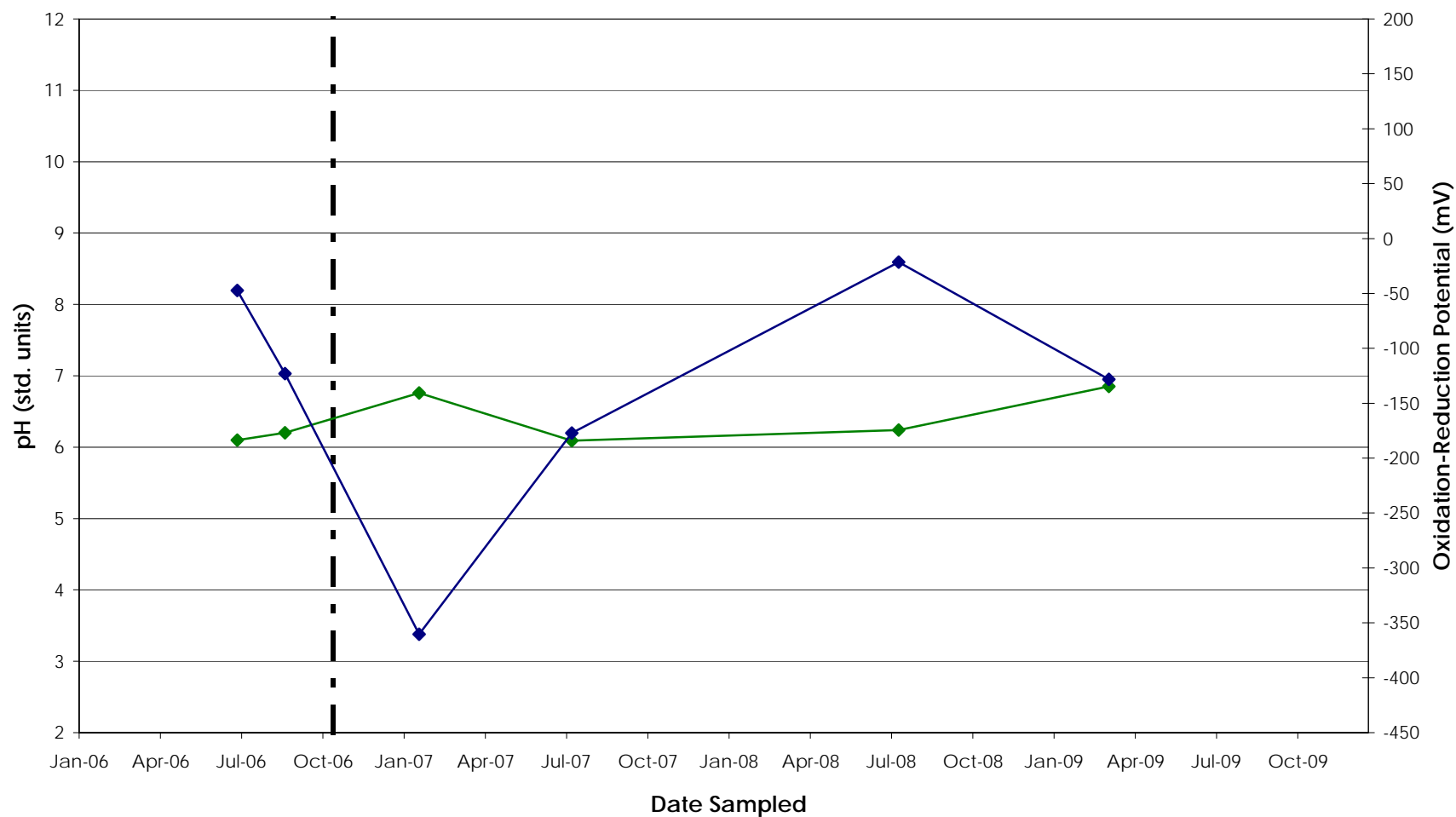
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Figure

E-17

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\GIS\Output\NIP TimeTrendPlot_20091113.k8\START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at ML-3-2

Site 45, Parris Island MCRD, Parris Island, SC

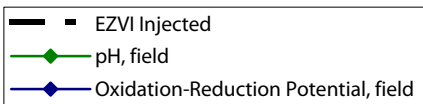
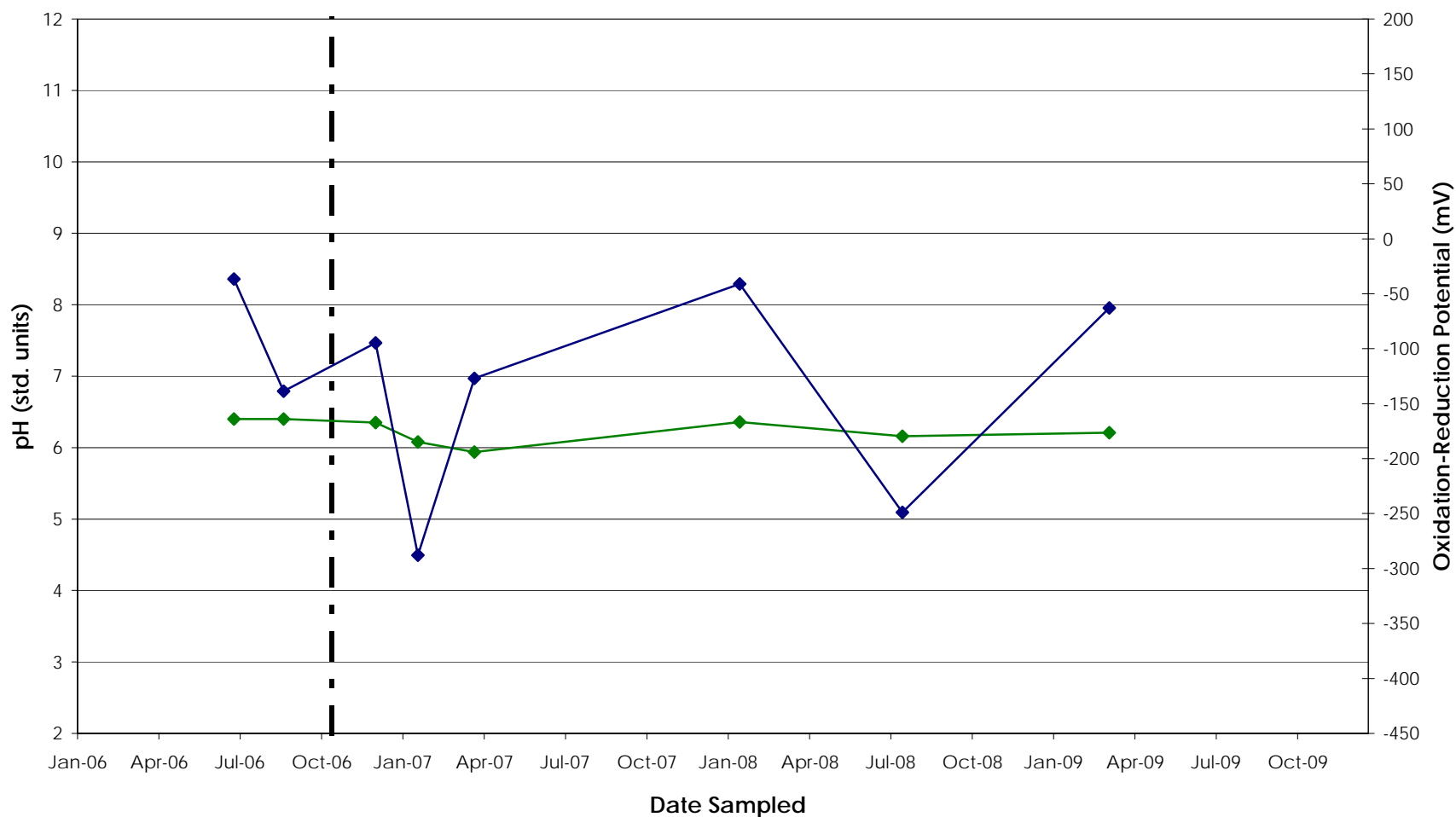
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Figure

E-18



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-3-3

Site 45, Parris Island MCRD, Parris Island, SC

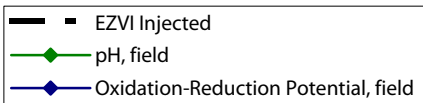
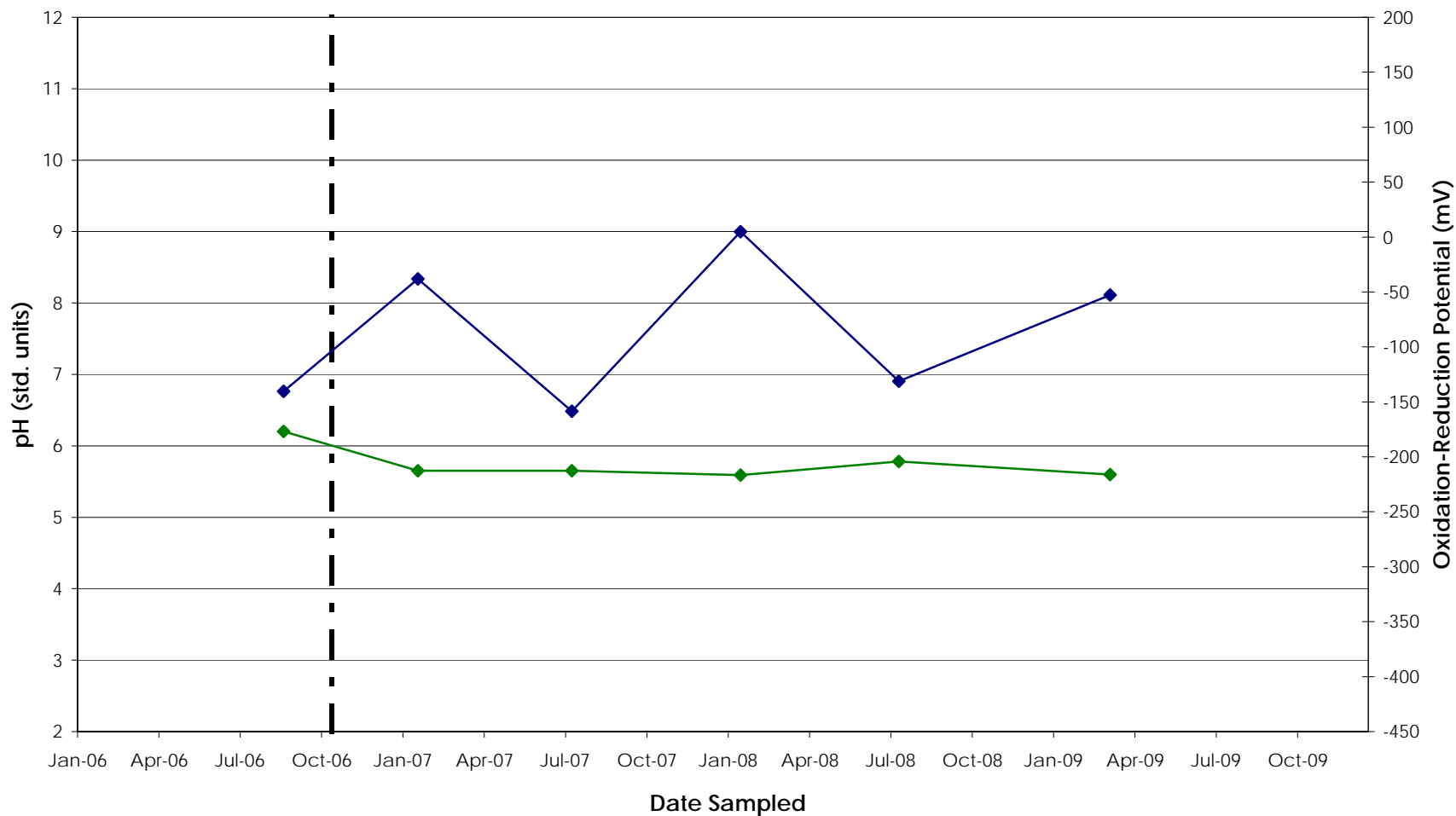
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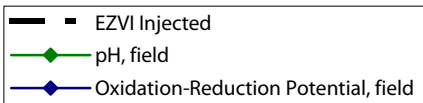
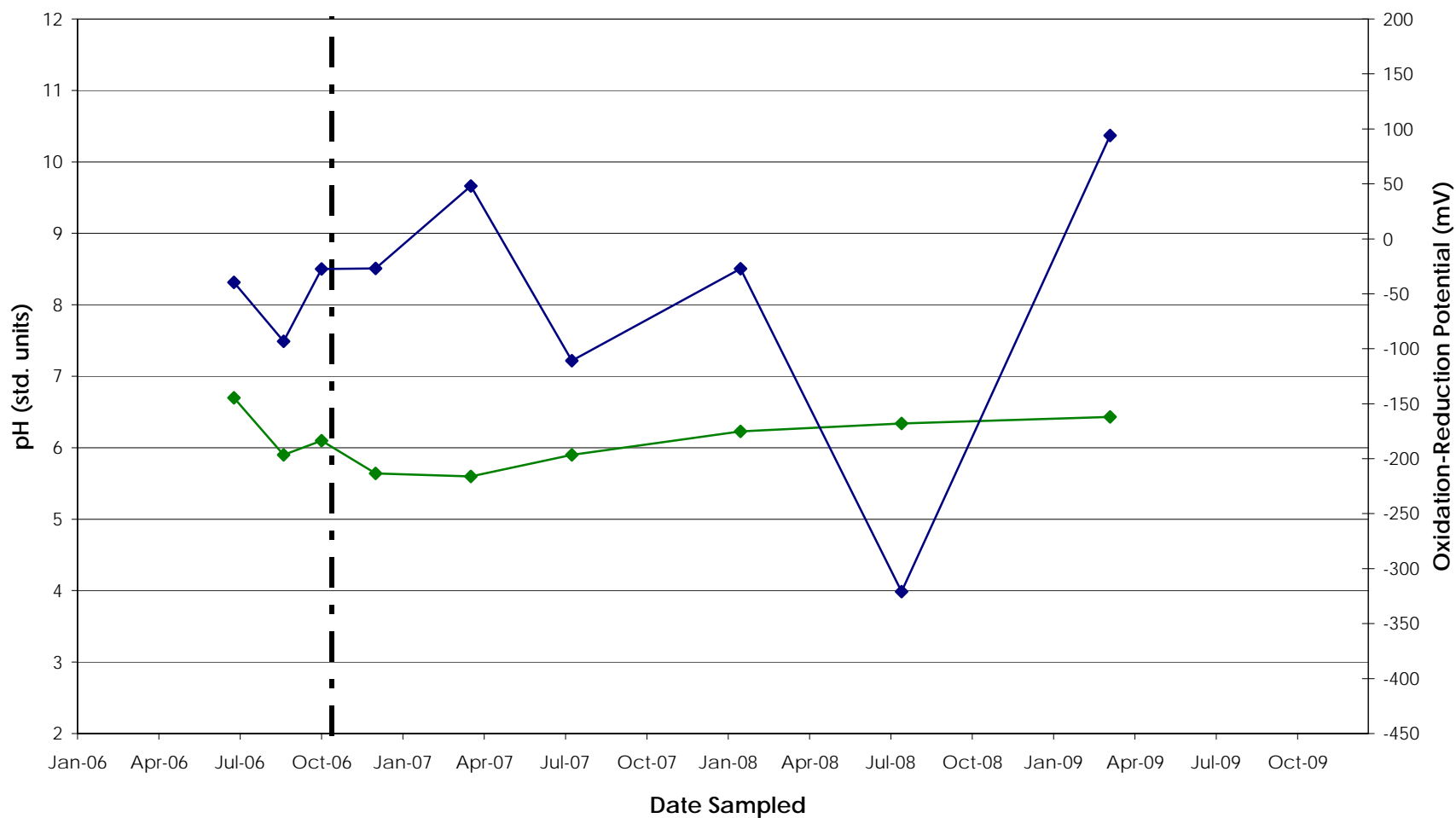
Figure

E-19



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-3-4 Site 45, Parris Island MCRD, Parris Island, SC	
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Figure E-20	



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-3-5

Site 45, Parris Island MCRD, Parris Island, SC

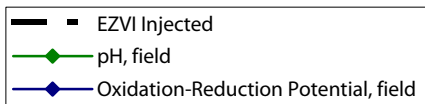
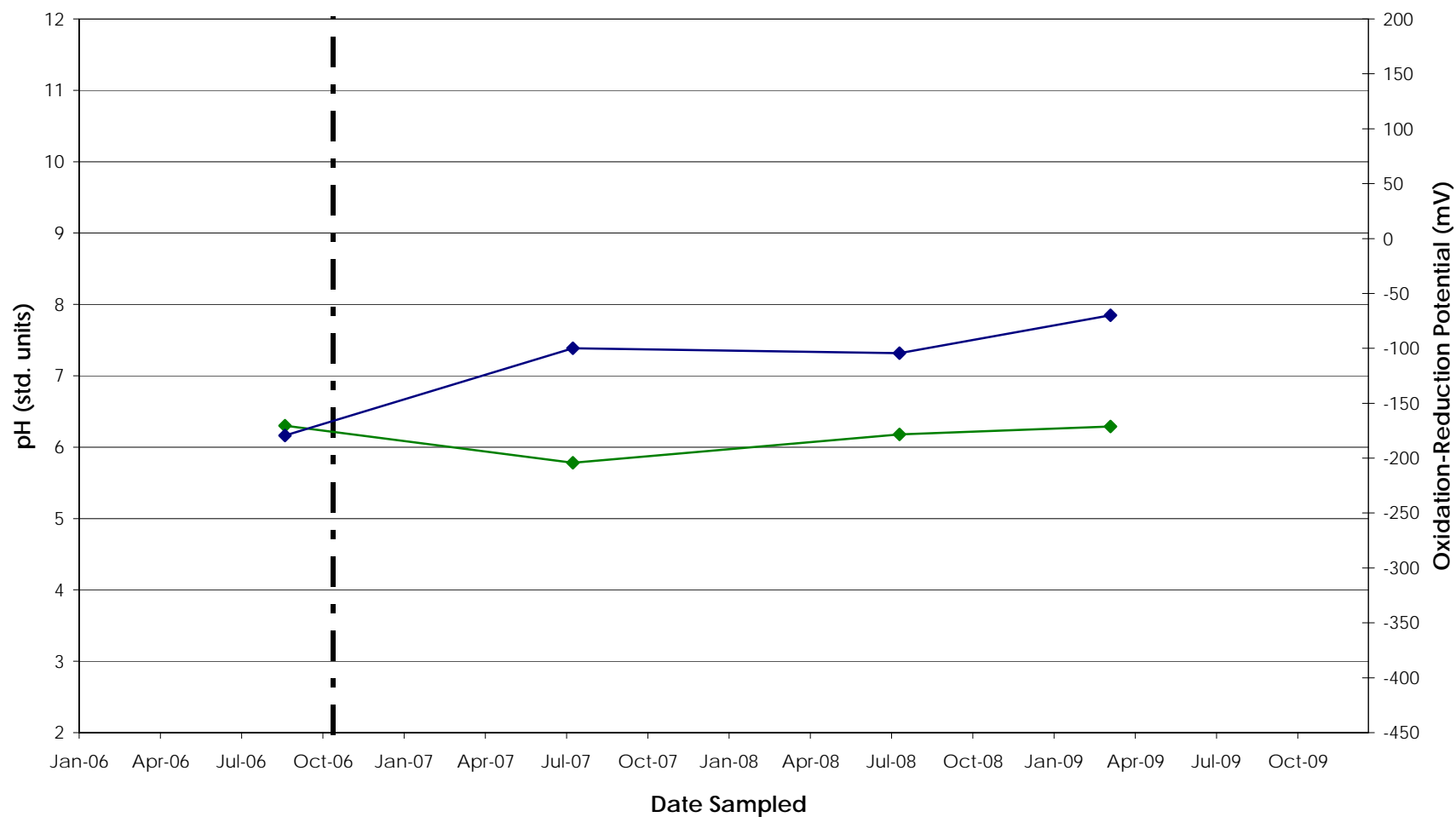
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Figure

E-21



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-3-6

Site 45, Parris Island MCRD, Parris Island, SC

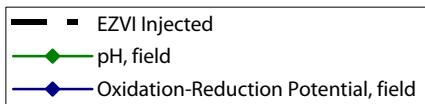
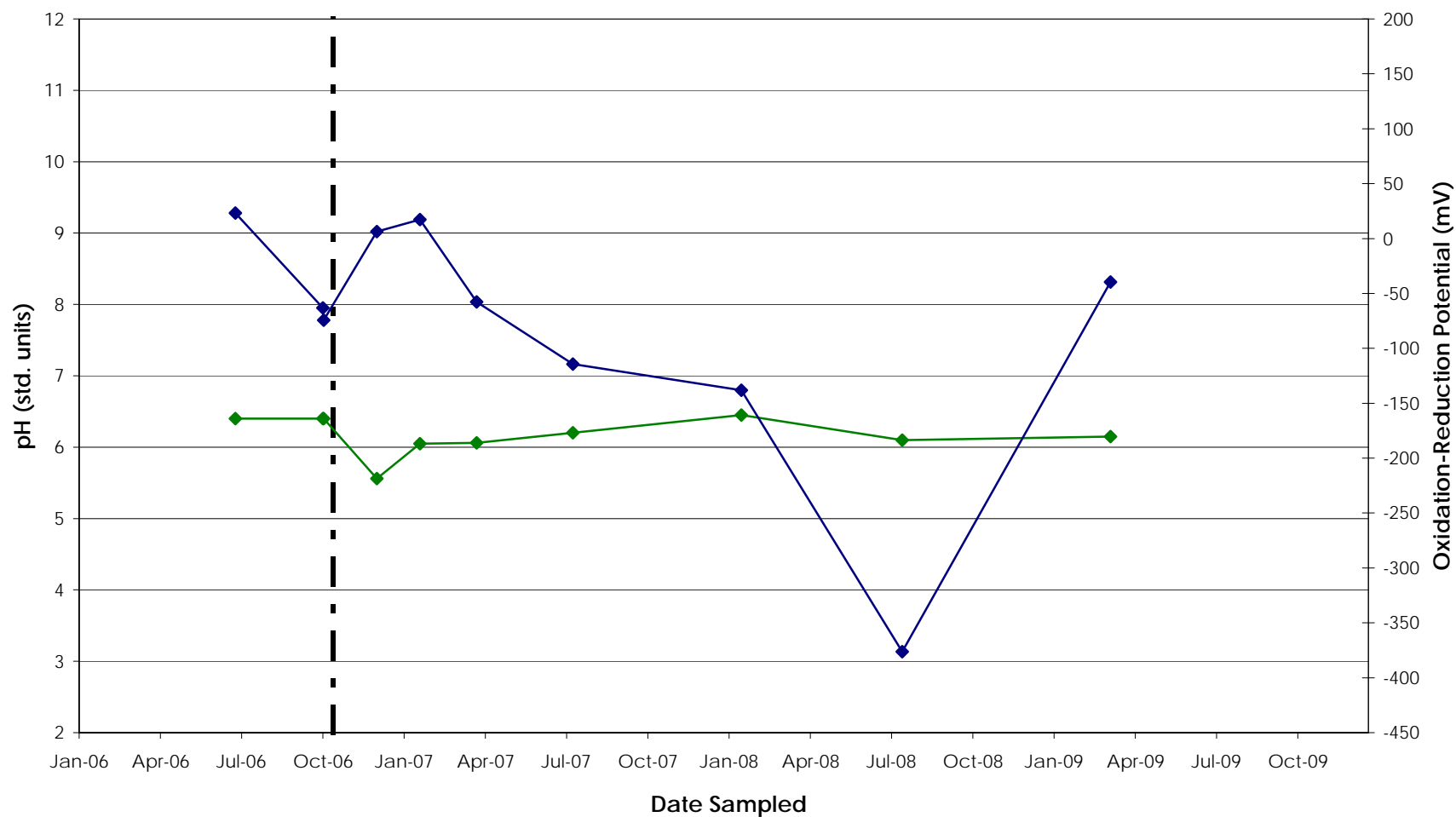
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Figure

E-22



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-3-7

Site 45, Parris Island MCRD, Parris Island, SC

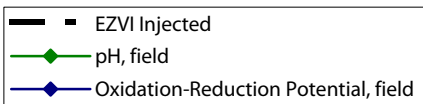
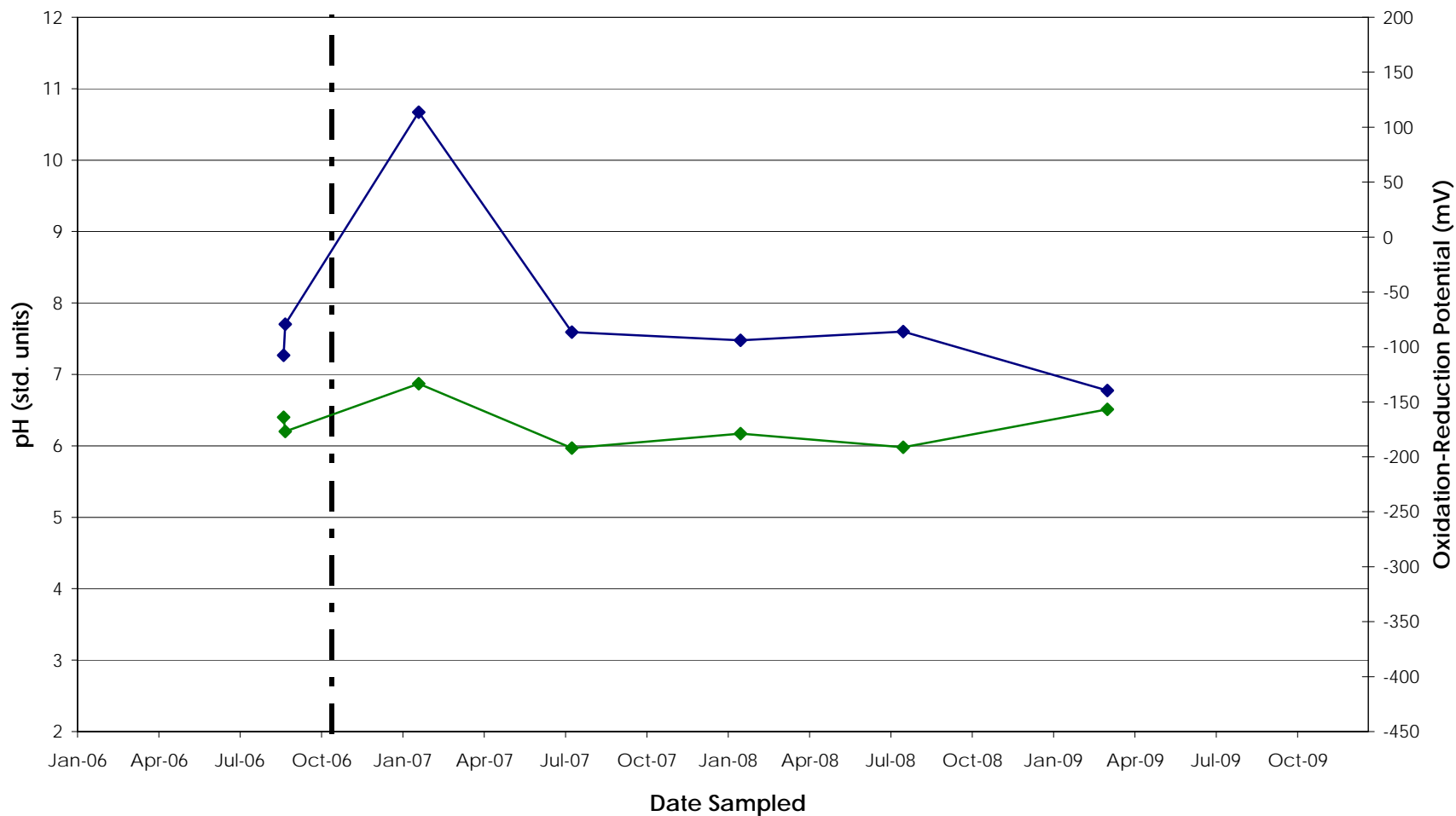
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Figure

E-23



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-4-2

Site 45, Parris Island MCRD, Parris Island, SC

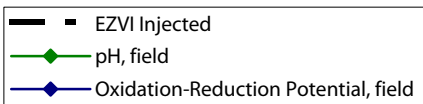
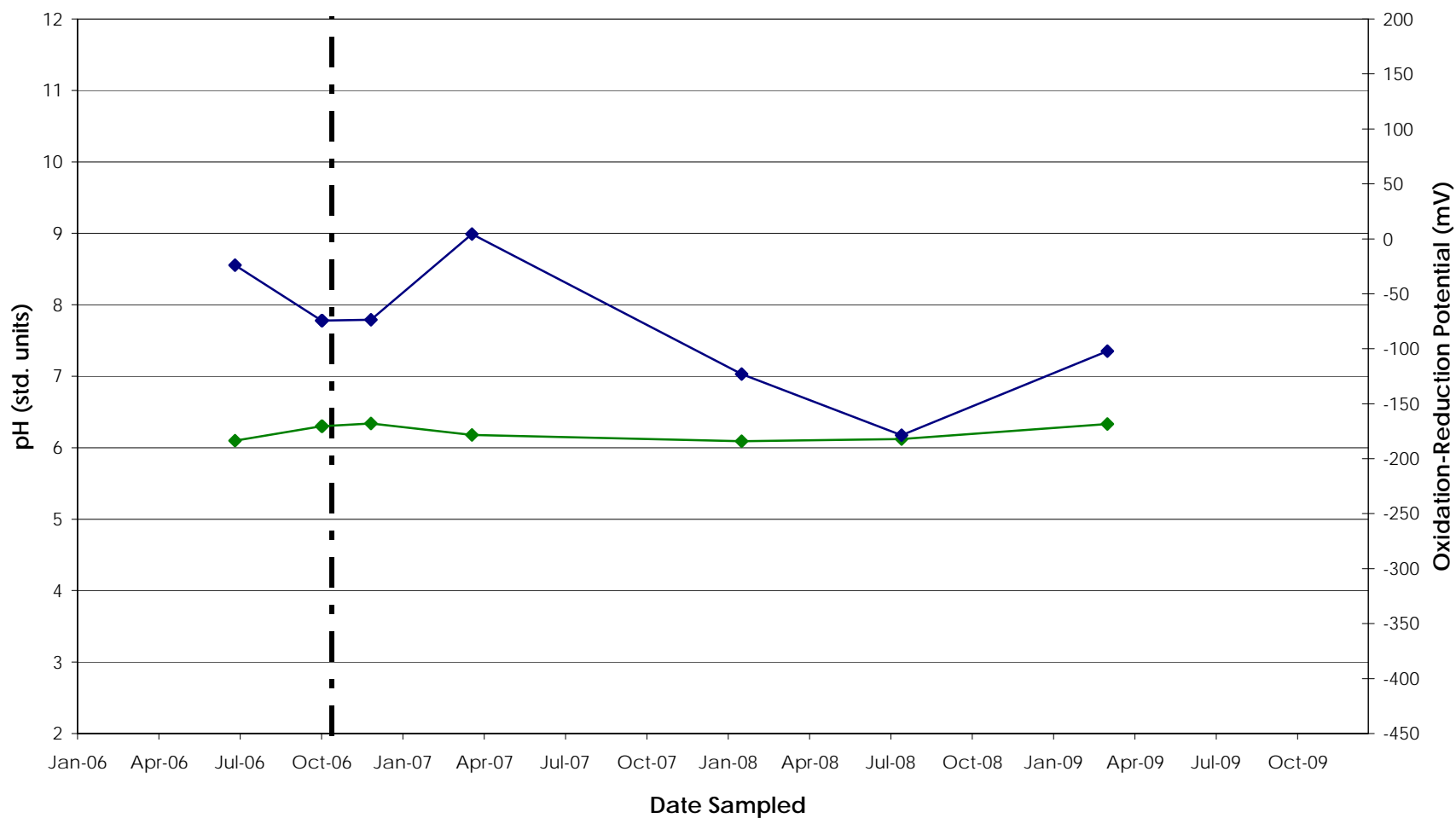
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Figure

E-24



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-4-3

Site 45, Parris Island MCRD, Parris Island, SC

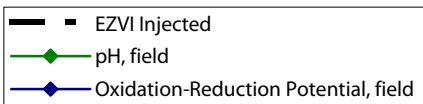
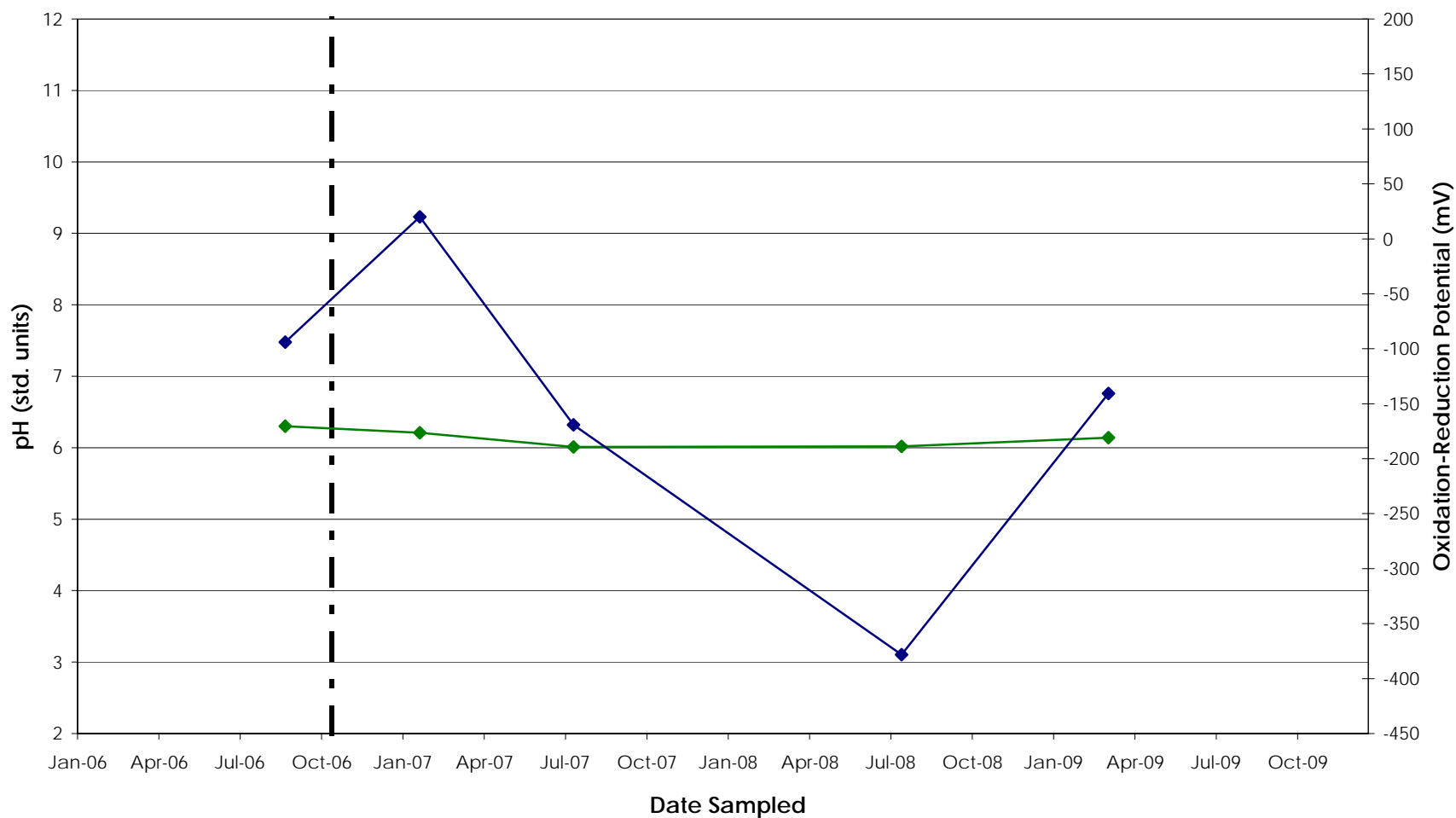
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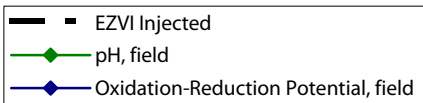
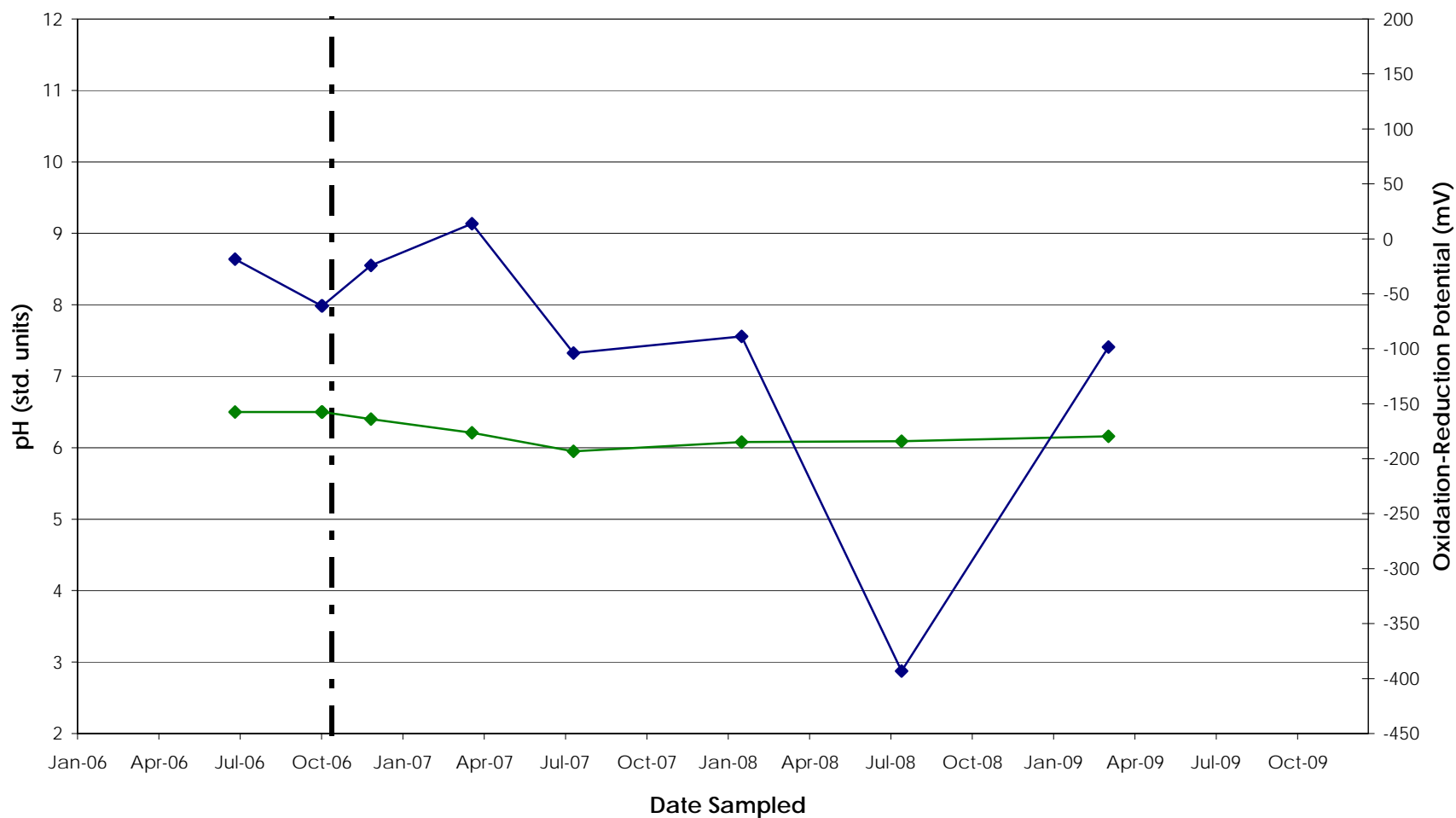
Figure

E-25



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-4-4 Site 45, Parris Island MCRD, Parris Island, SC	
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Figure E-26	



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-4-5

Site 45, Parris Island MCRD, Parris Island, SC

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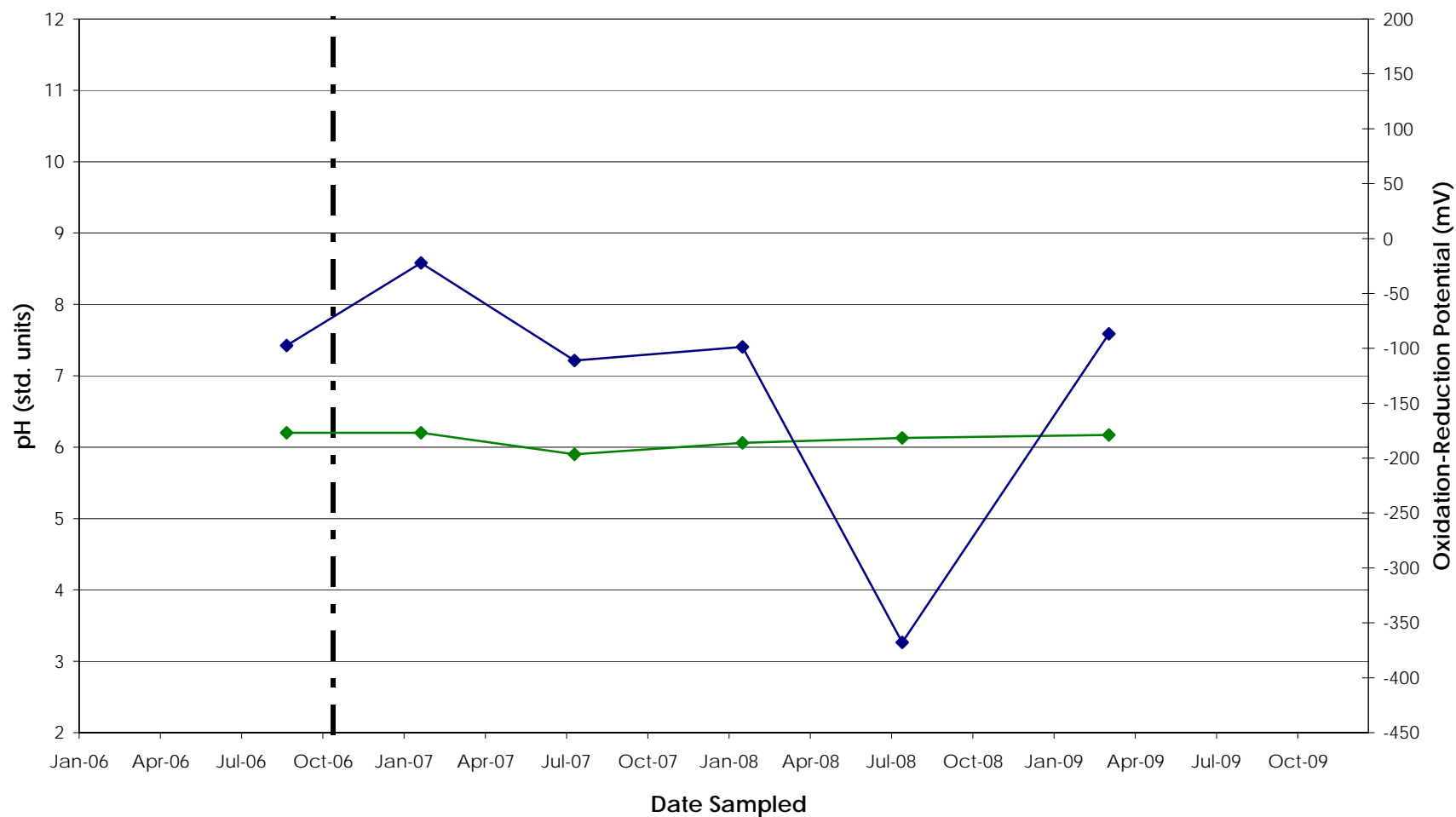
Guelph

November 2009

Figure

E-27

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\Data base&GIS\Output\Plot_TrendPlot_20091113.xls\$START



ORP and pH Trends at ML-4-6

Site 45, Parris Island MCRD, Parris Island, SC

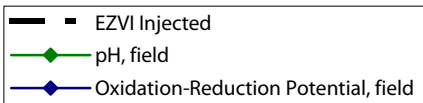
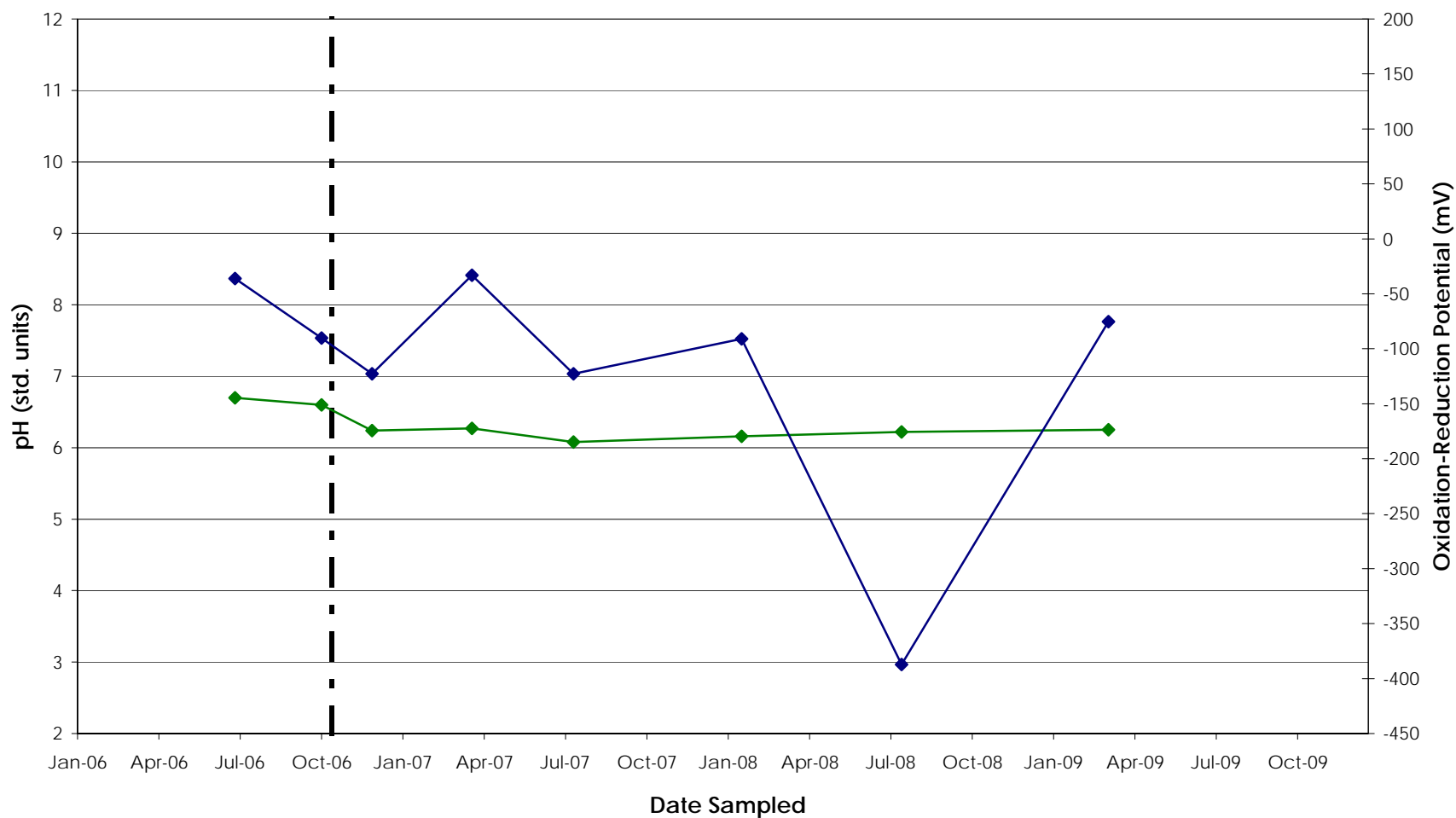
Geosyntec
consultants

Guelph

November 2009

Figure

E-28



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-4-7

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
 consultants

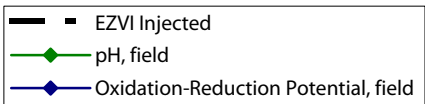
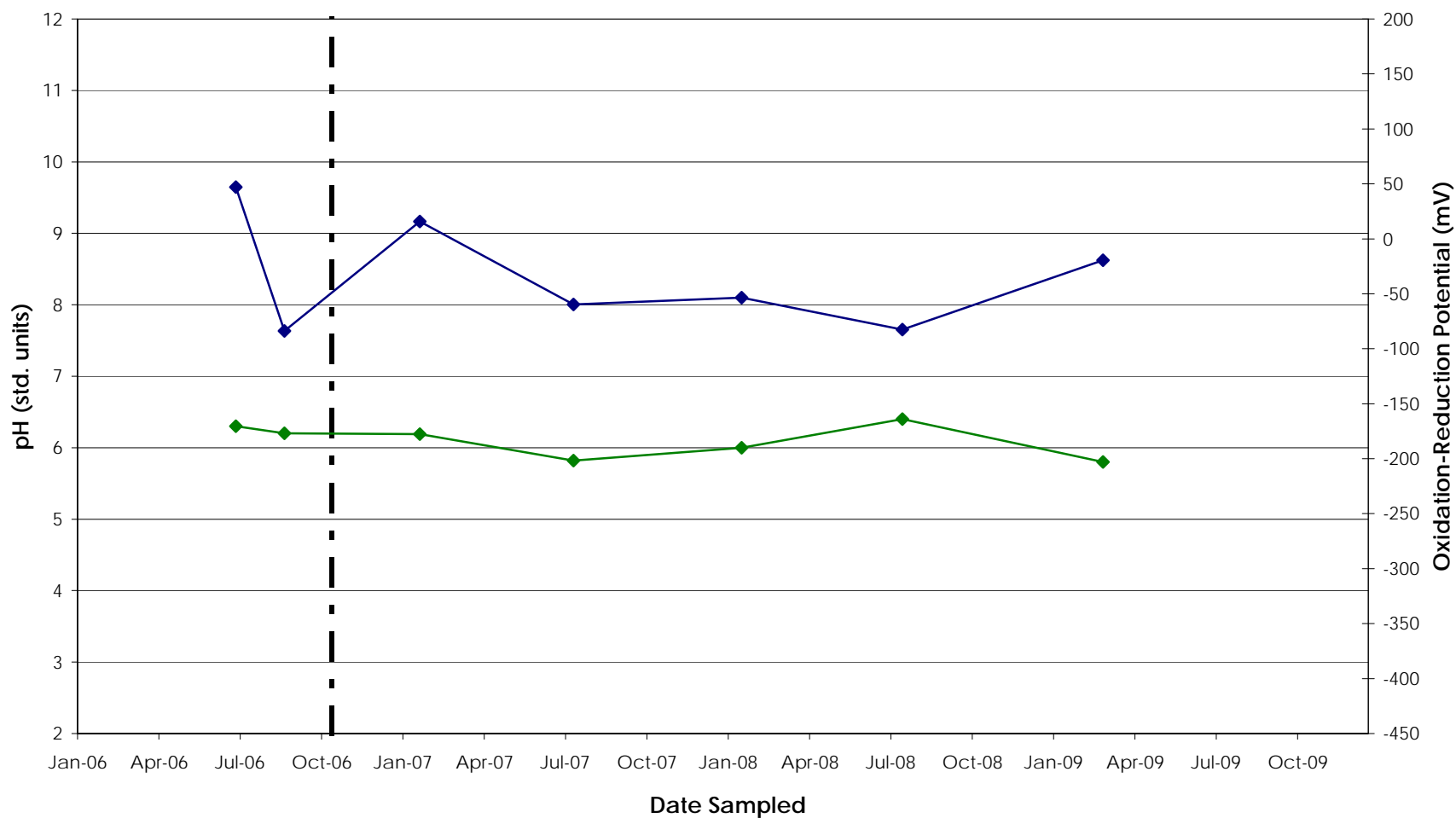
Guelph

November 2009

Figure

E-29

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\Data base&GIS\Output\Plot_TrendPlot_20091113.xls\$START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at ML-5-2

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
consultants

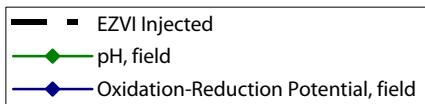
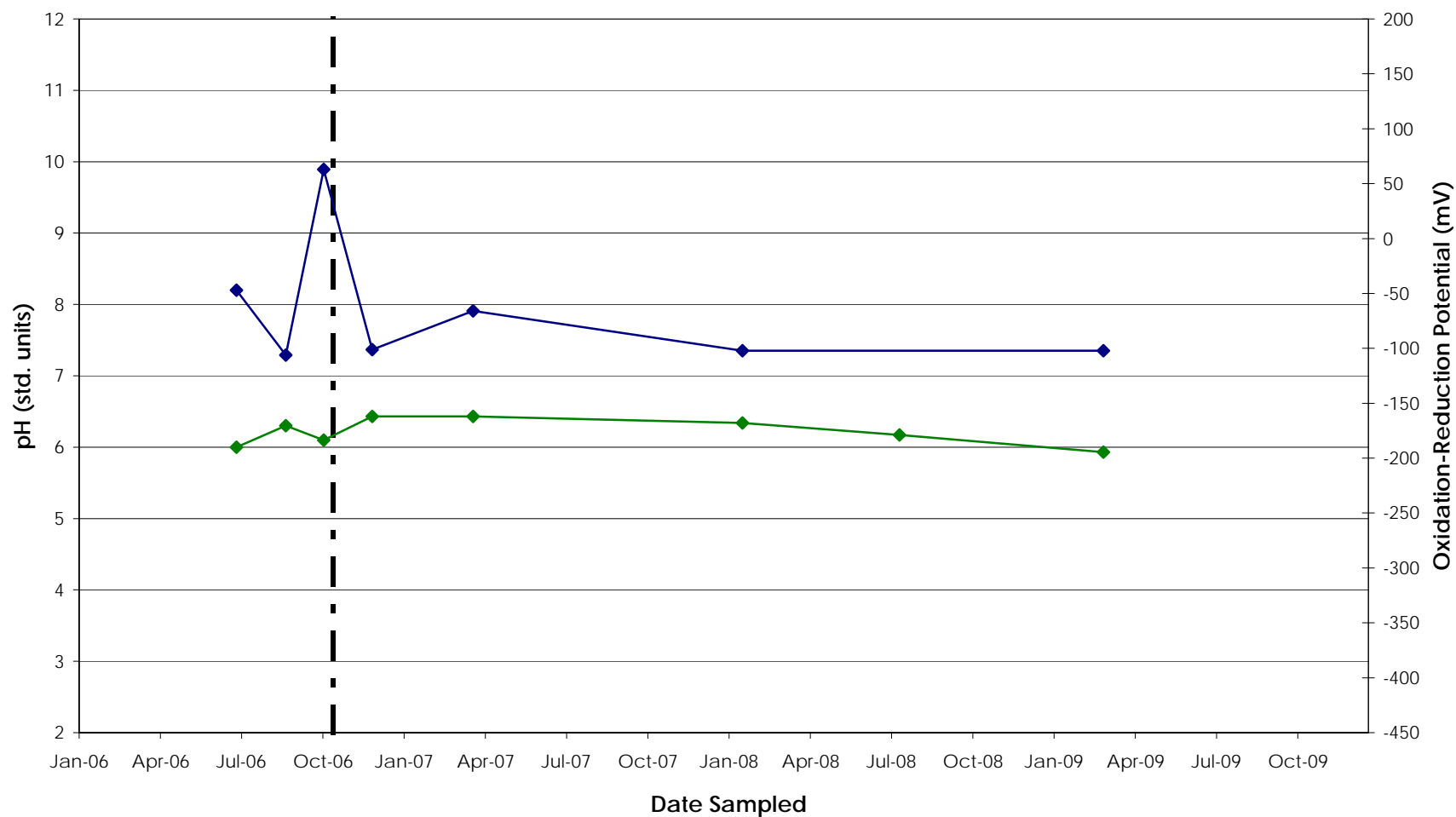
Guelph

November 2009

Figure

E-30

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\GIS\Output\Plot_TrendPlot_20091113.k81\START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at ML-5-3

Site 45, Parris Island MCRD, Parris Island, SC

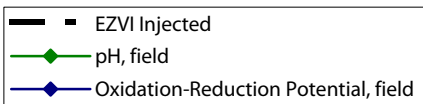
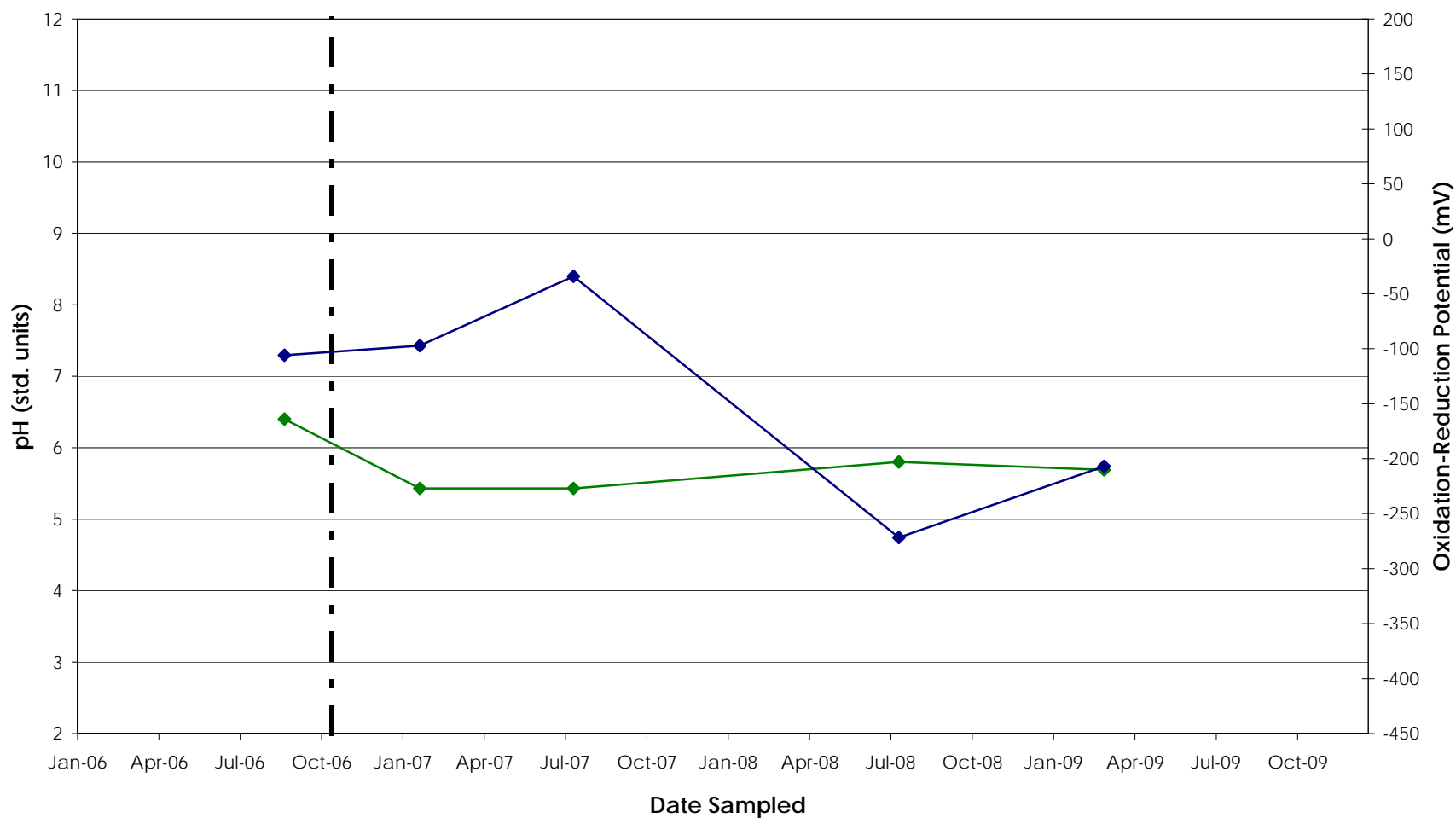
Geosyntec
consultants

Guelph

November 2009

Figure

E-31



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-5-4

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
 consultants

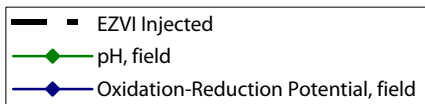
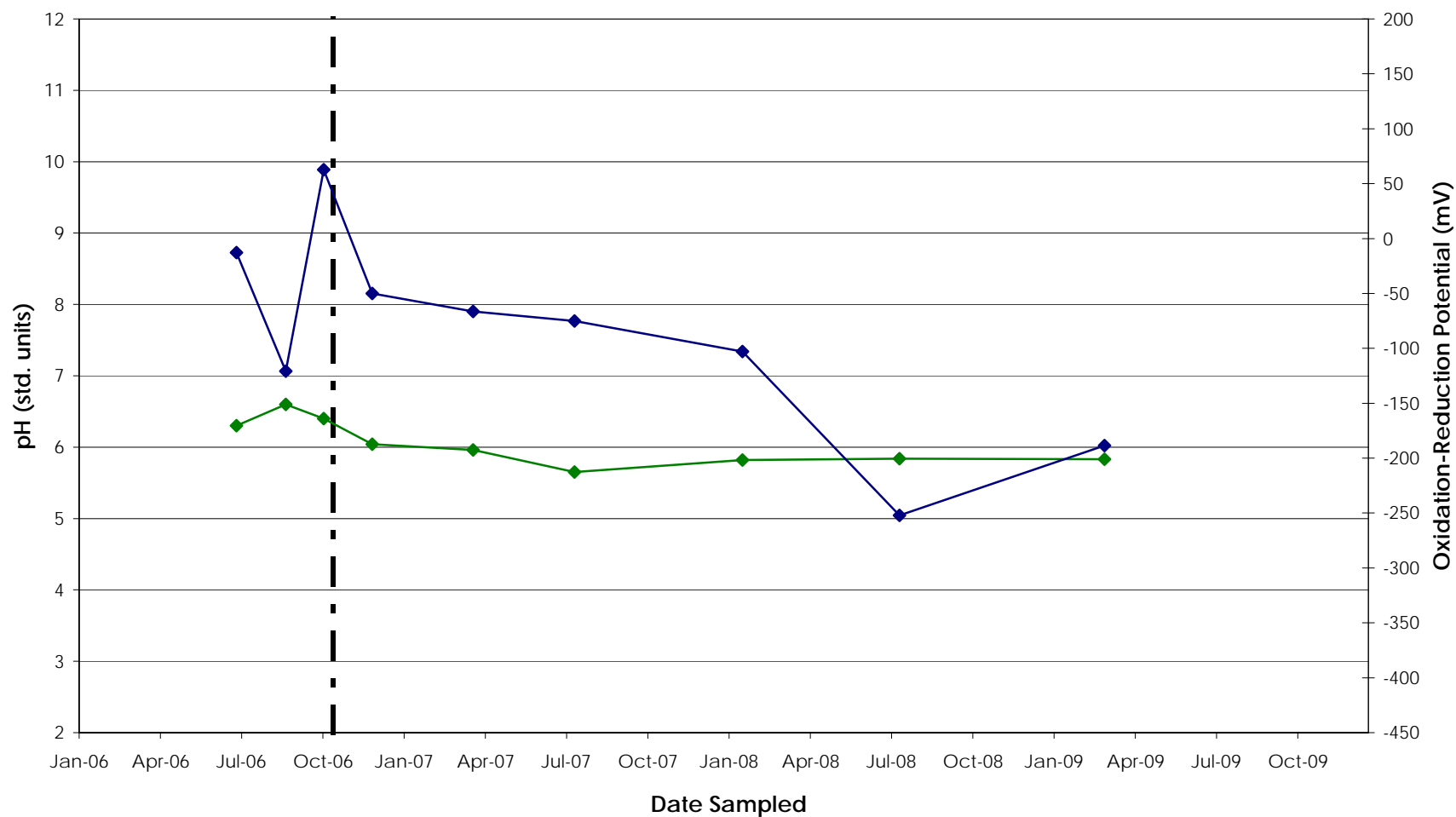
Guelph

November 2009

Figure

E-32

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\GIS\Output\NIP TimeTrendPlot_20091113.xls\$START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at ML-5-5

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
consultants

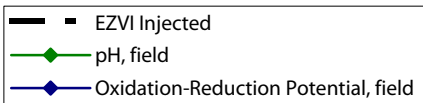
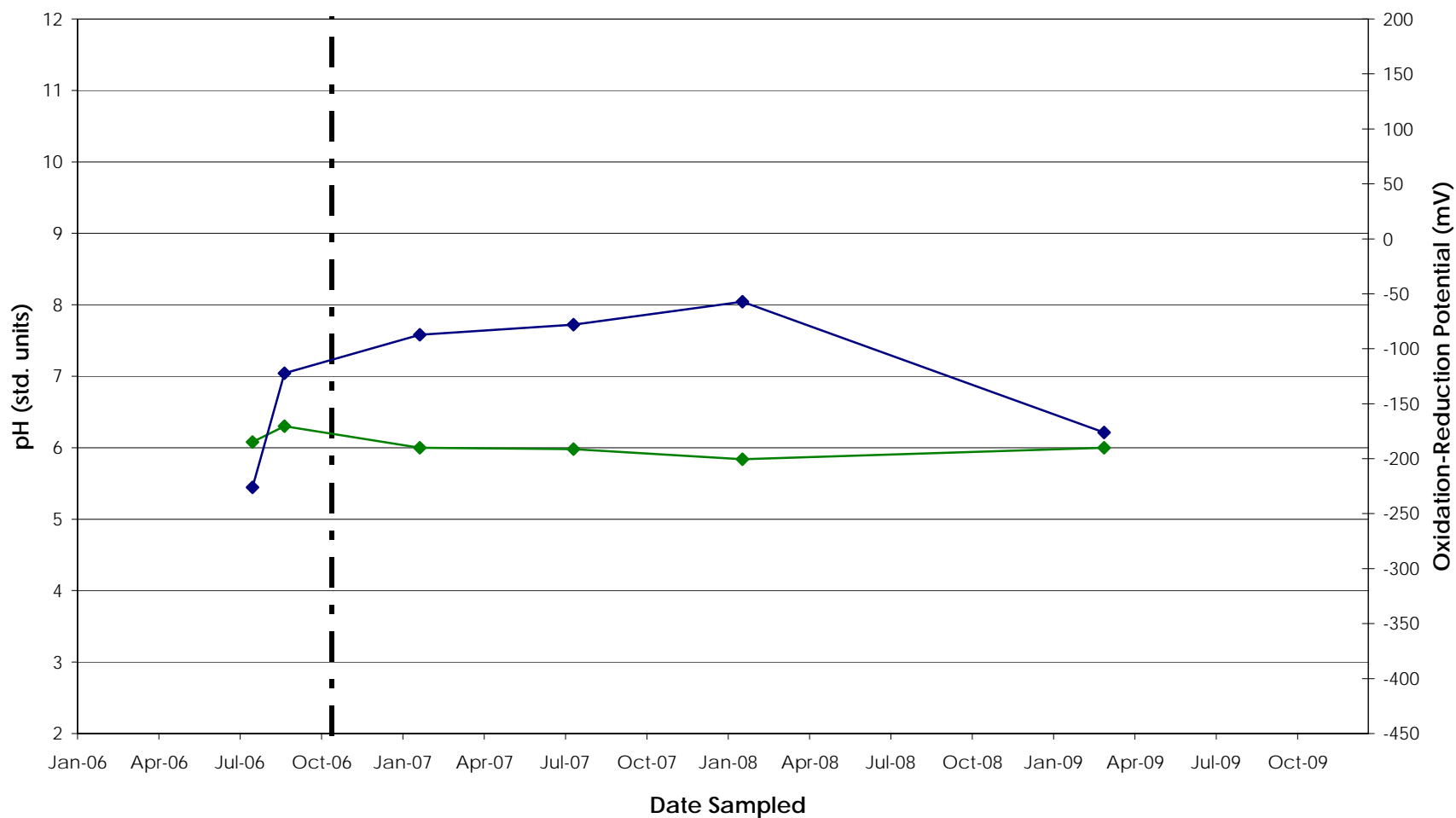
Guelph

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Figure

E-33

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\Data base&GIS\Output\Plot_TrendPlot_20091113.xls\$START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at ML-5-6

Site 45, Parris Island MCRD, Parris Island, SC

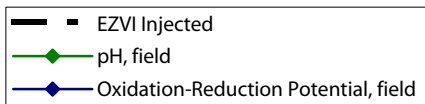
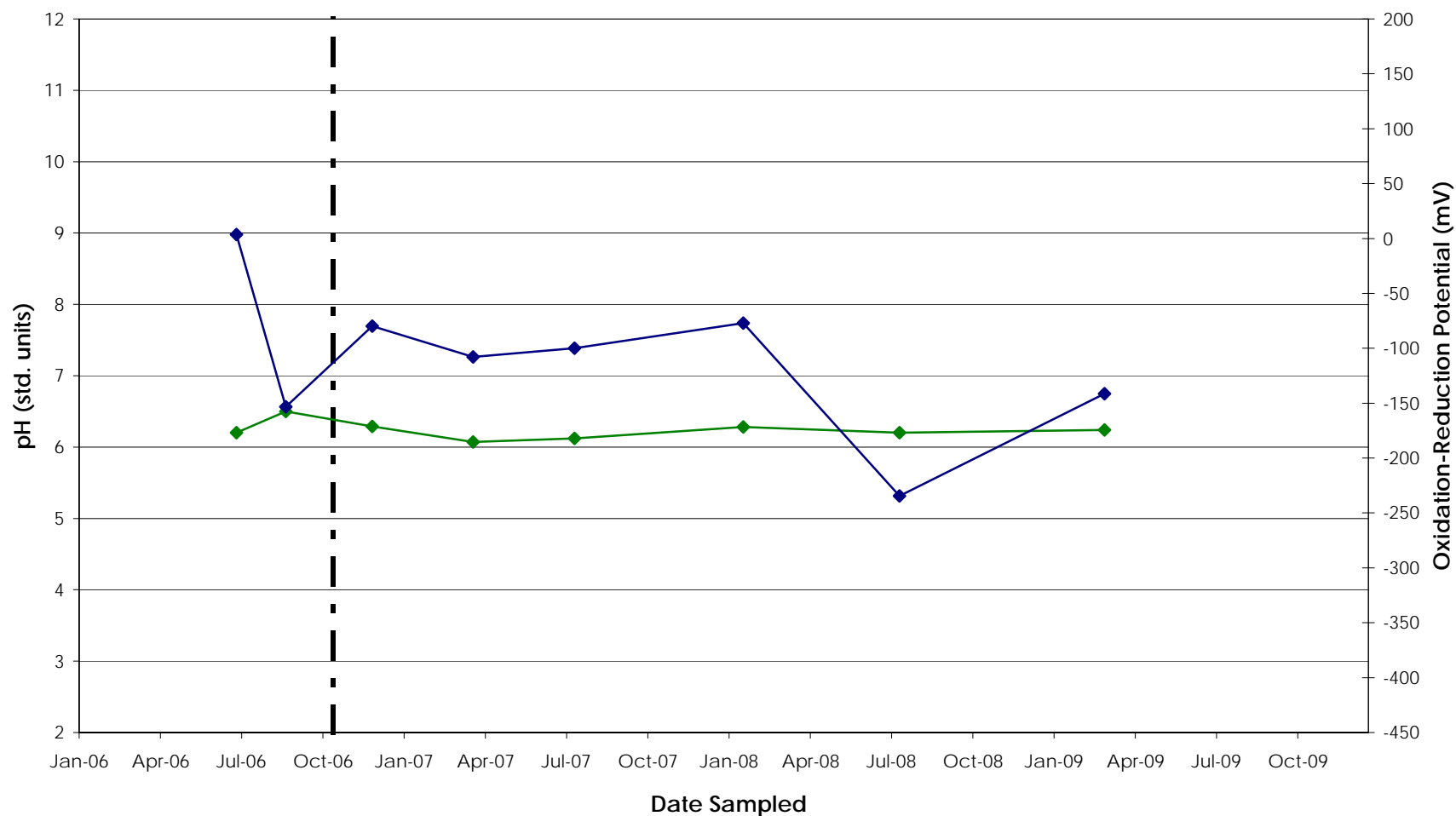
Geosyntec
consultants

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November 2009

Figure

E-34



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-5-7

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
 consultants

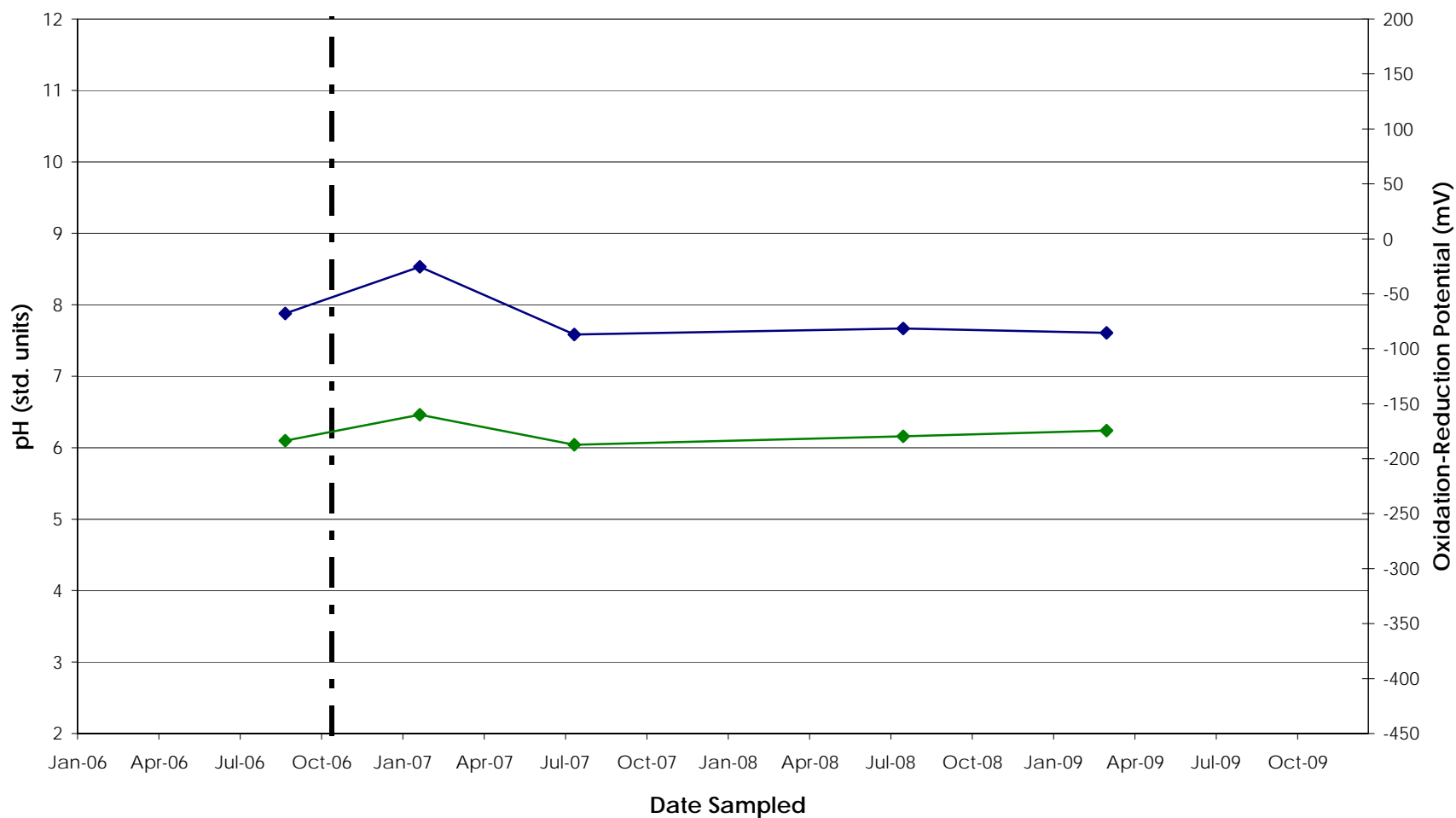
Guelph

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Figure

E-35

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\Data base&GIS\Output\Plot_TrendPlot_20091113.xls\$START



ORP and pH Trends at ML-6-2

Site 45, Parris Island MCRD, Parris Island, SC

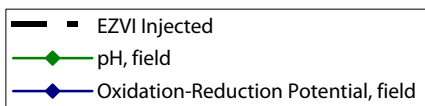
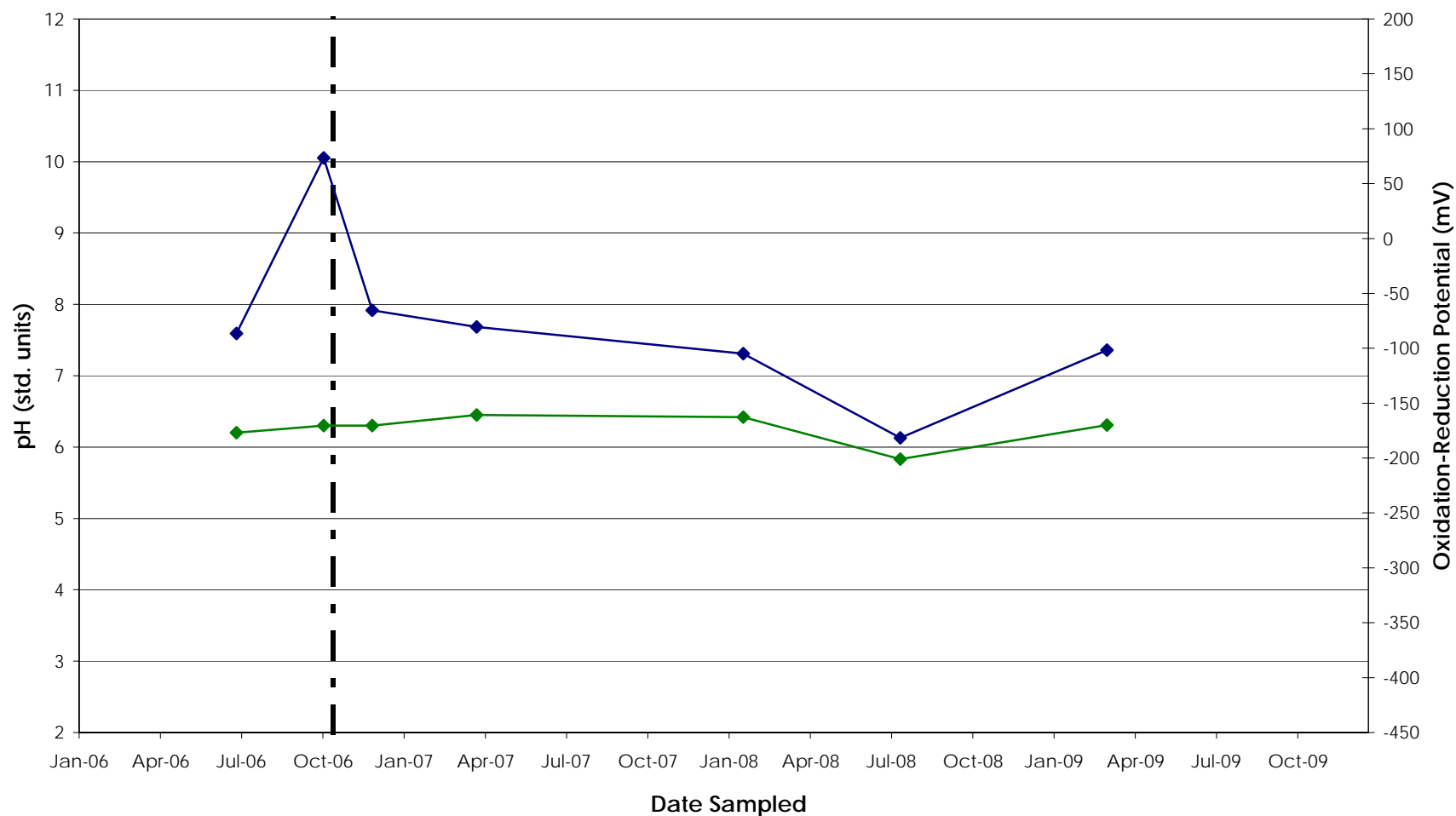
Geosyntec
consultants

Guelph

November 2009

Figure

E-36



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-6-3

Site 45, Parris Island MCRD, Parris Island, SC

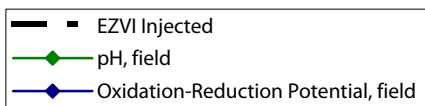
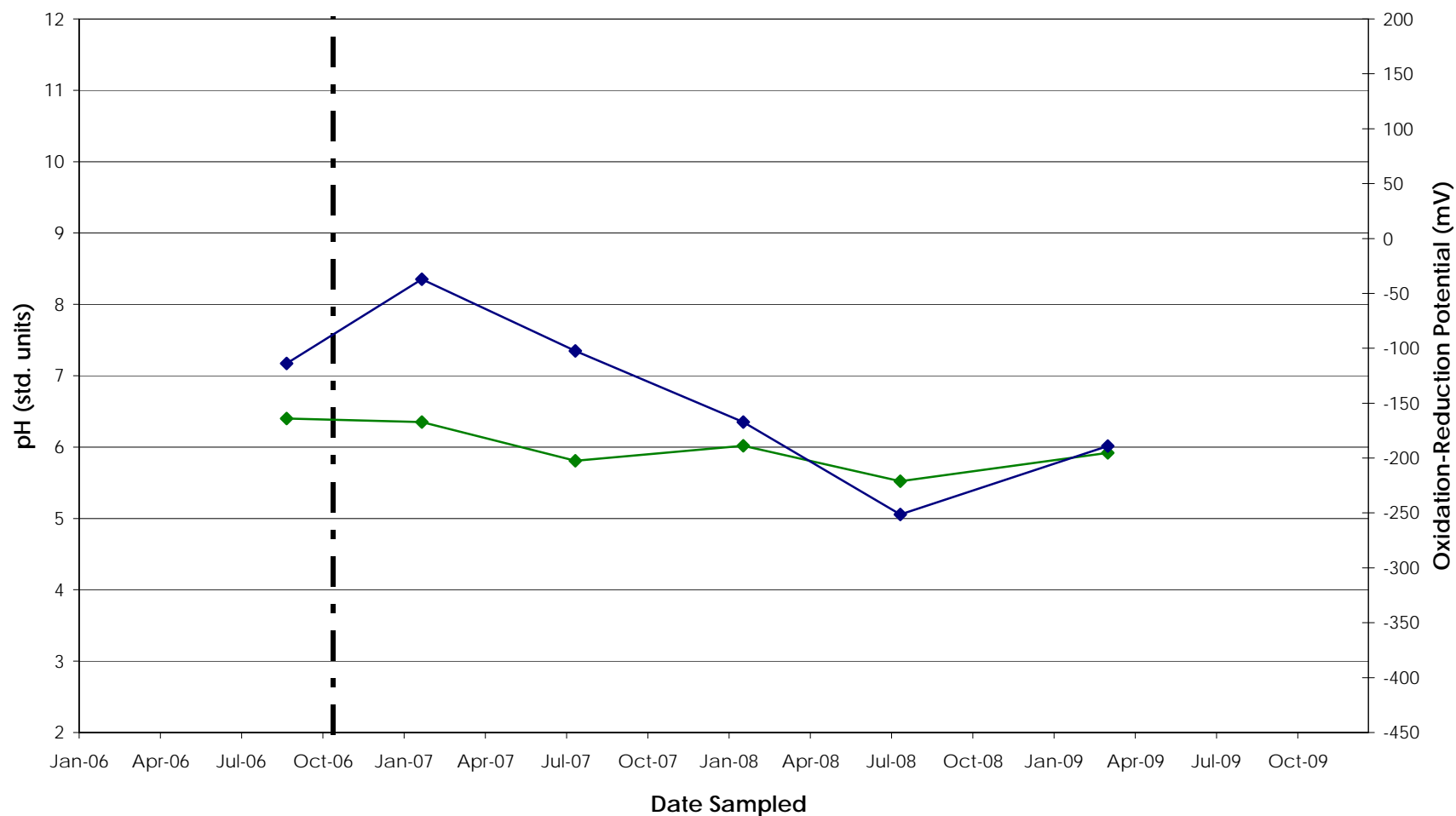
Geosyntec
 consultants

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Figure

E-37



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-6-4

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
 consultants

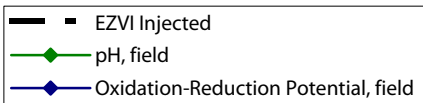
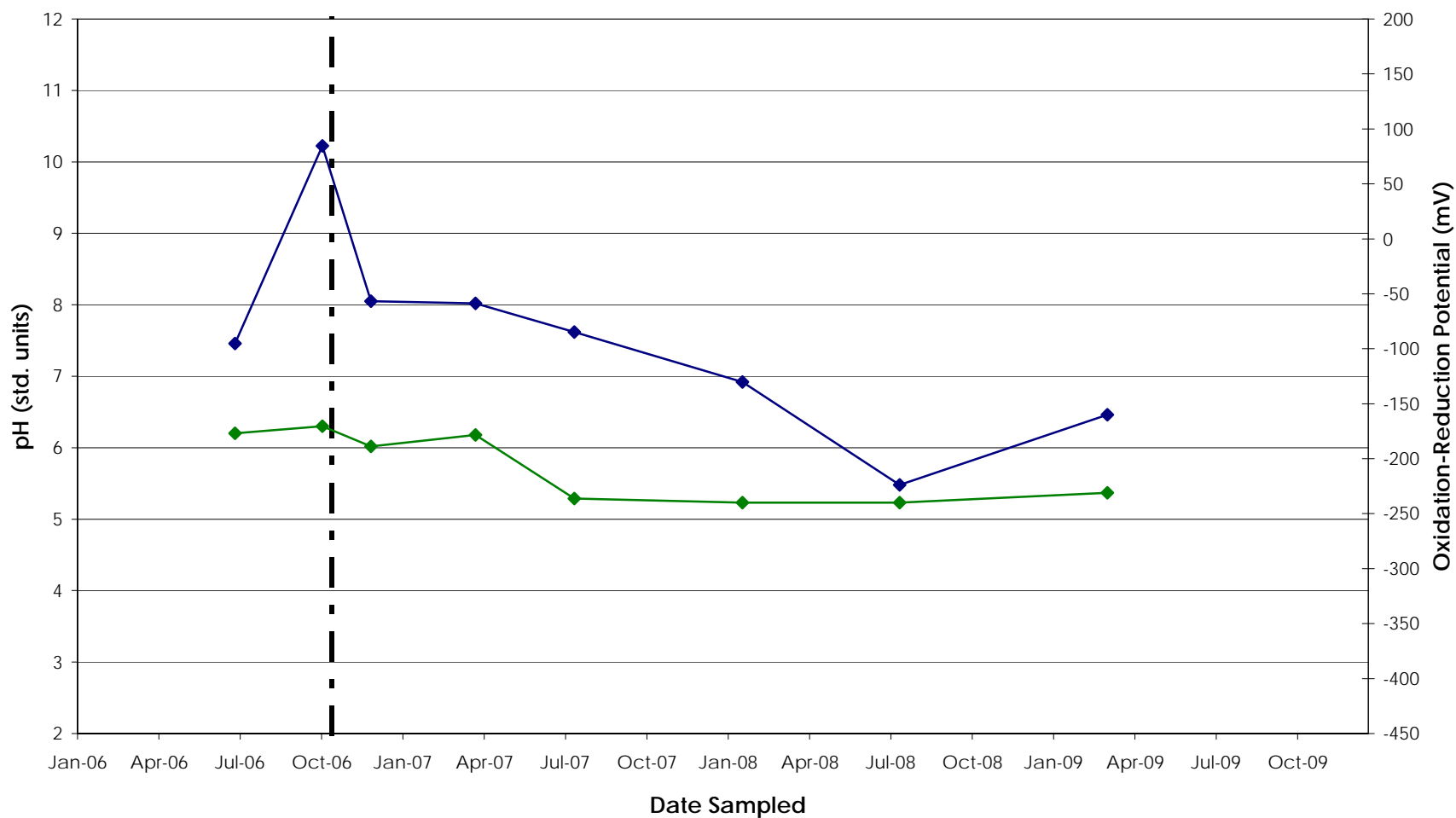
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Figure

E-38

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\Data base&GIS\Output\Plot_TrendPlot_20091113.xls\START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at ML-6-5

Site 45, Parris Island MCRD, Parris Island, SC

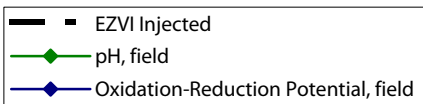
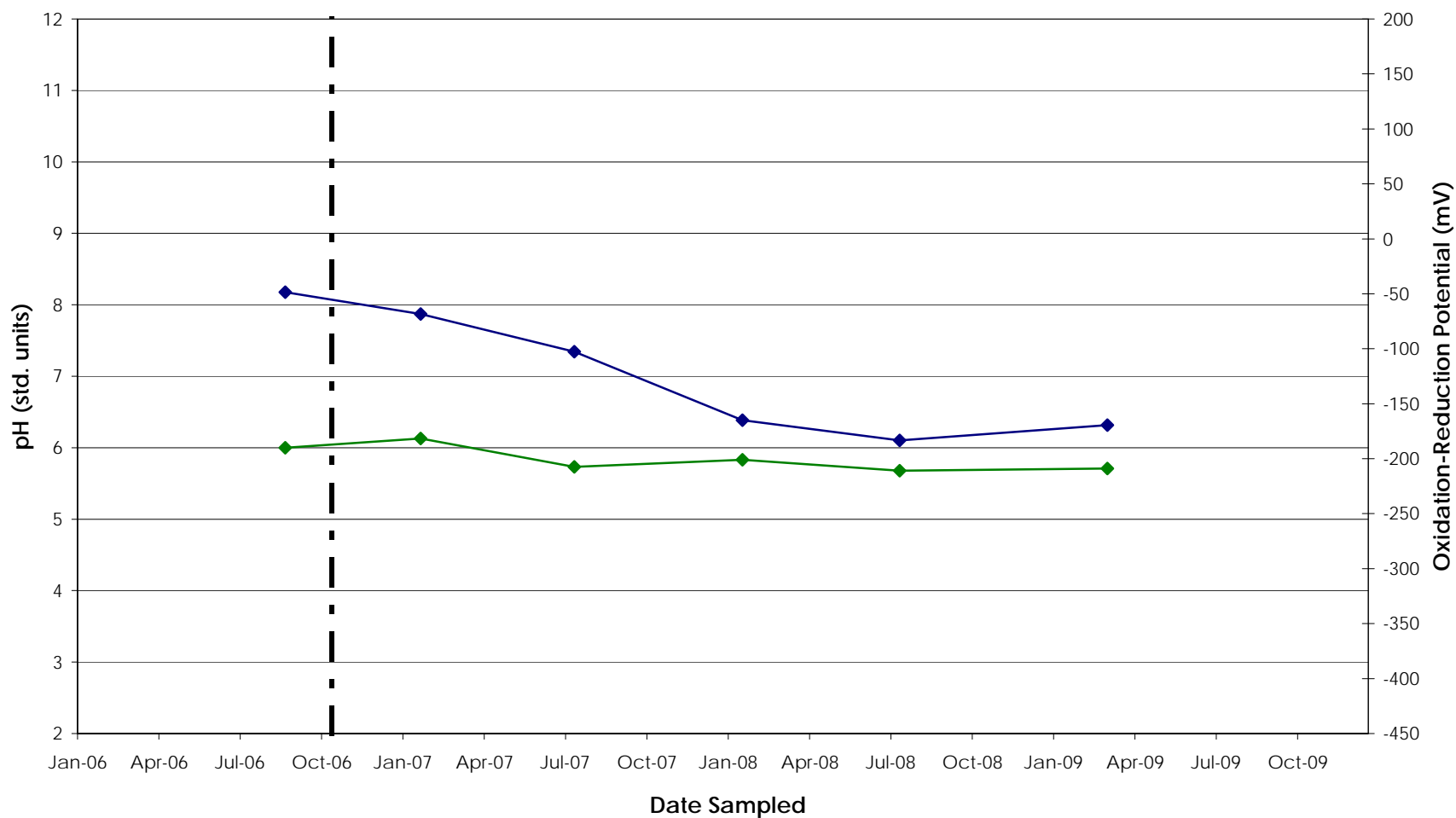
Geosyntec
consultants

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Figure

E-39



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-6-6

Site 45, Parris Island MCRD, Parris Island, SC

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 consultants

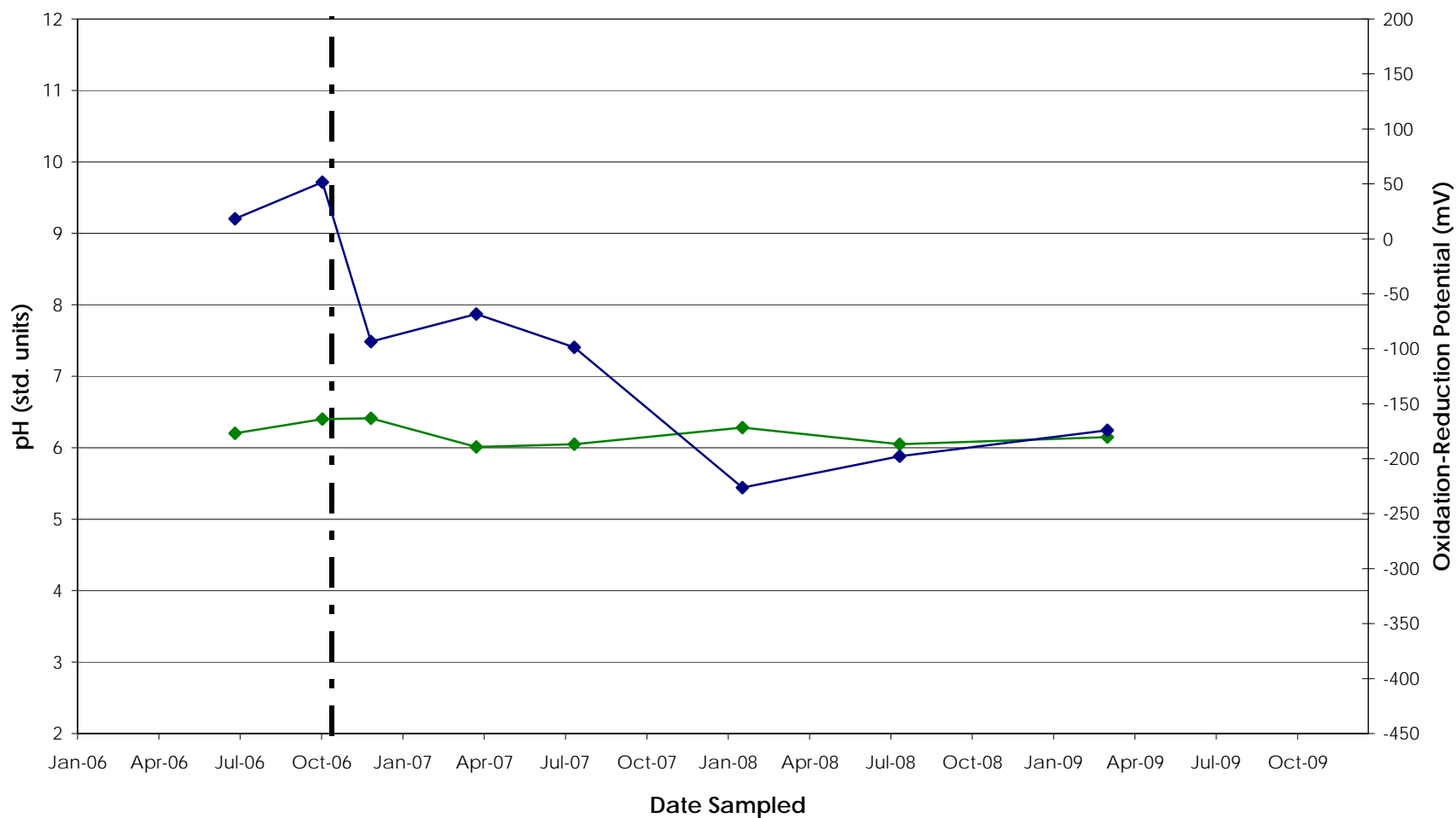
Guelph

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Figure

E-40

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\Data base&GIS\Output\Plot_TrendPlot_20091113.xls\$START



ORP and pH Trends at ML-6-7

Site 45, Parris Island MCRD, Parris Island, SC

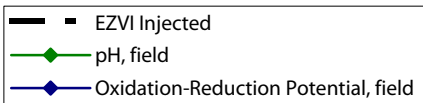
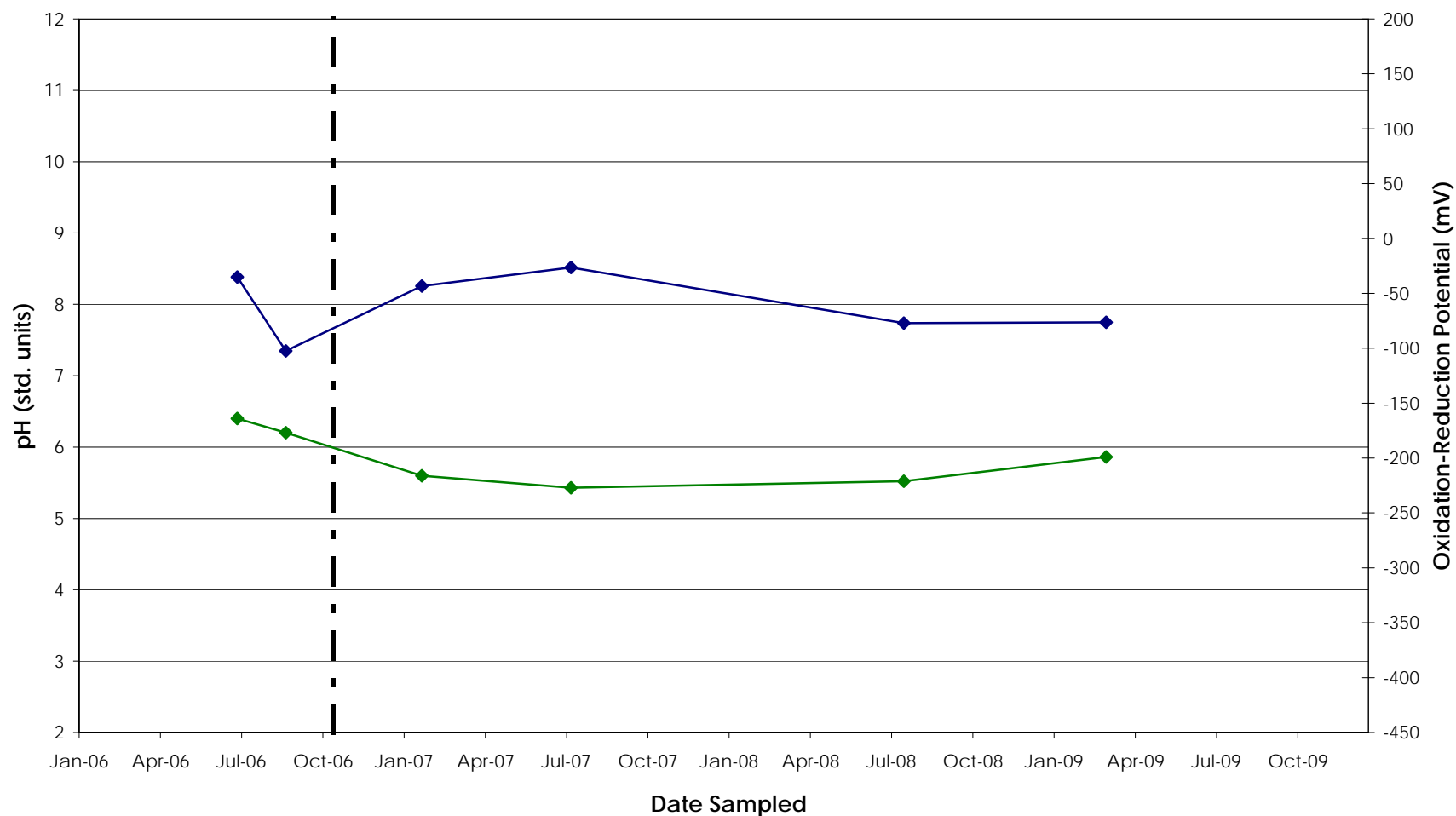
Geosyntec
consultants

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Figure

E-41



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-7-2

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
 consultants

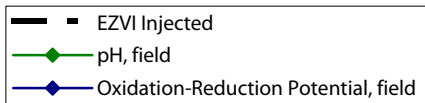
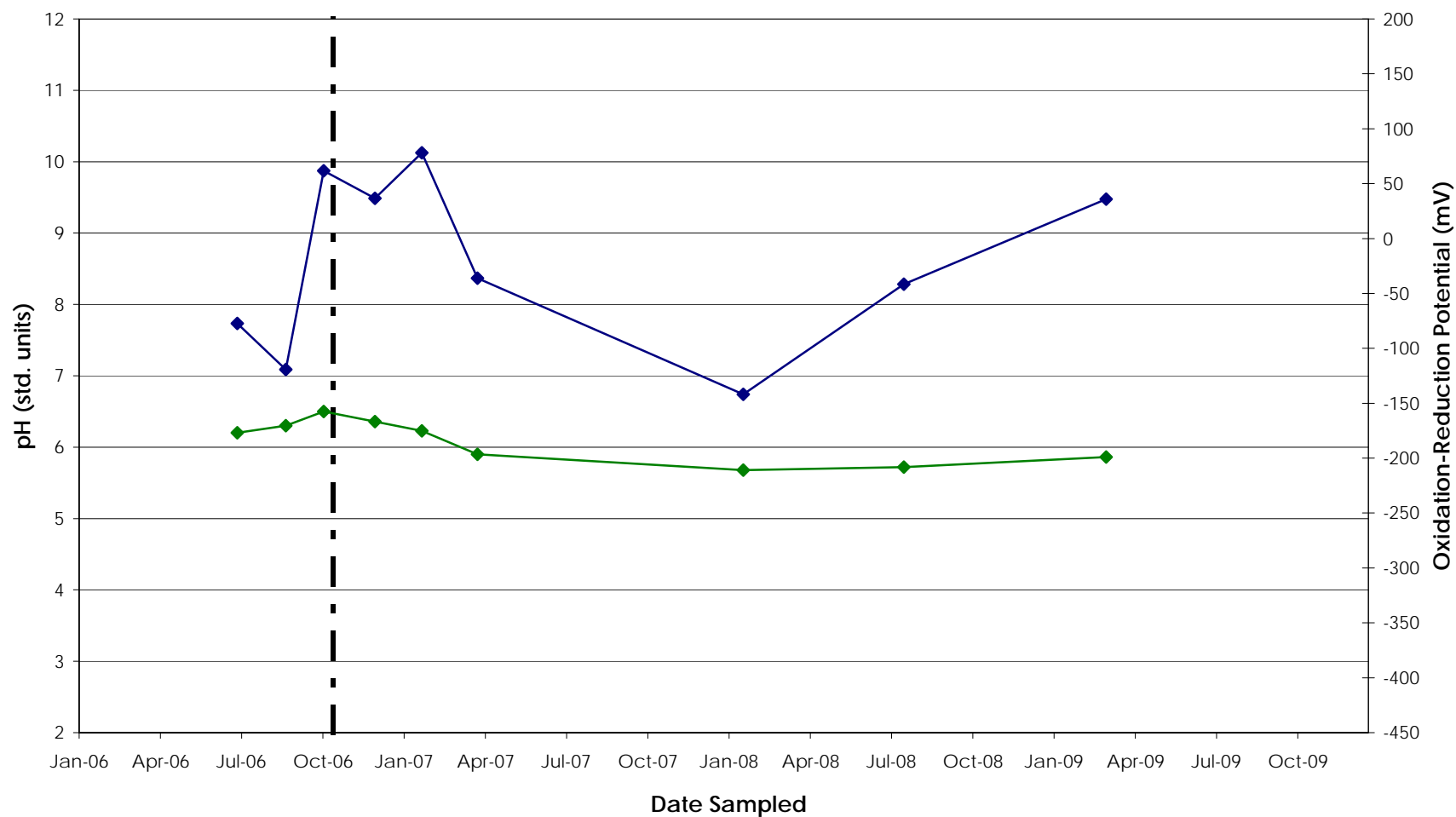
Guelph

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Figure

E-42

P:\PRJ\Projects\TR0713\ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\GIS\Output\NIP TimeTrendPlot_20091113.xls\$START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at ML-7-3

Site 45, Parris Island MCRD, Parris Island, SC

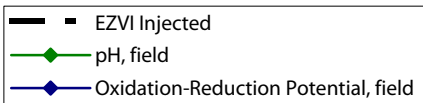
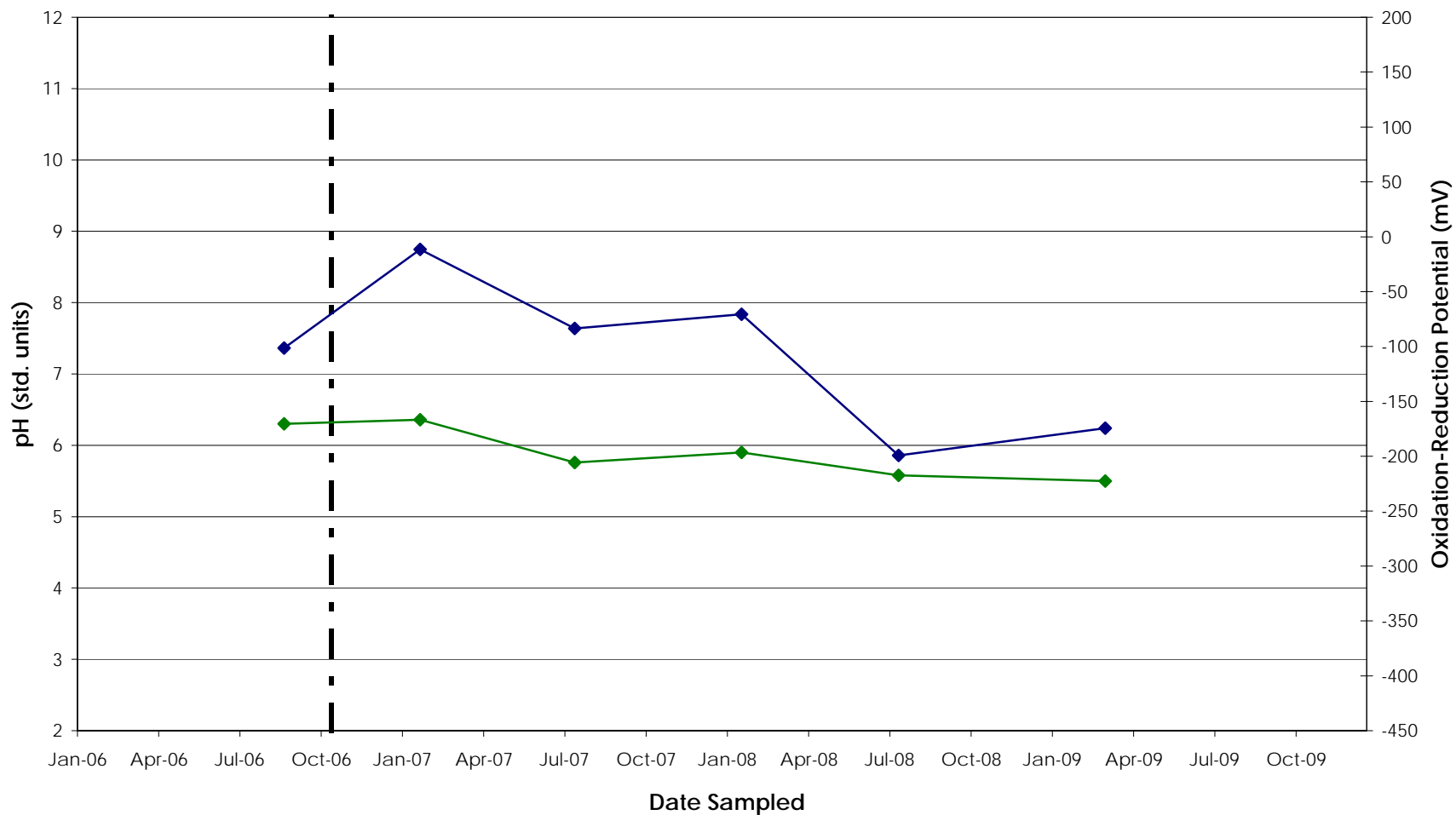
Geosyntec
consultants

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Figure

E-43



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at ML-7-4

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
 consultants

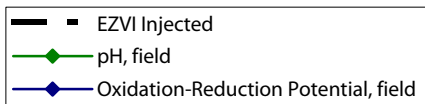
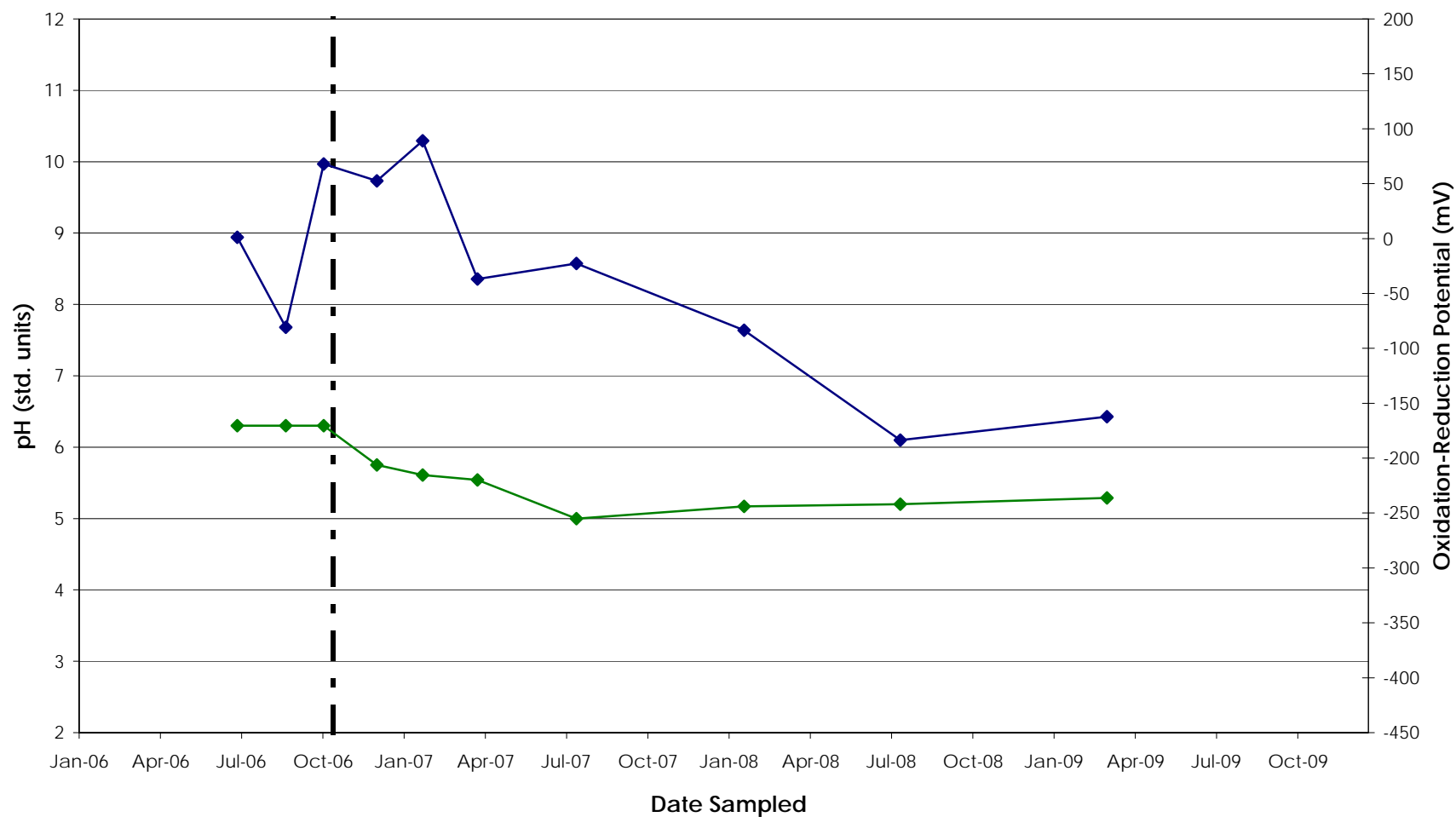
Guelph

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Figure

E-44

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\Data base&GIS\Output\Plot_TrendPlot_20091113.xls\$START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at ML-7-5

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
consultants

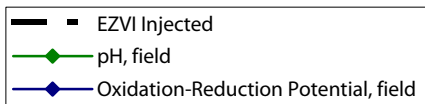
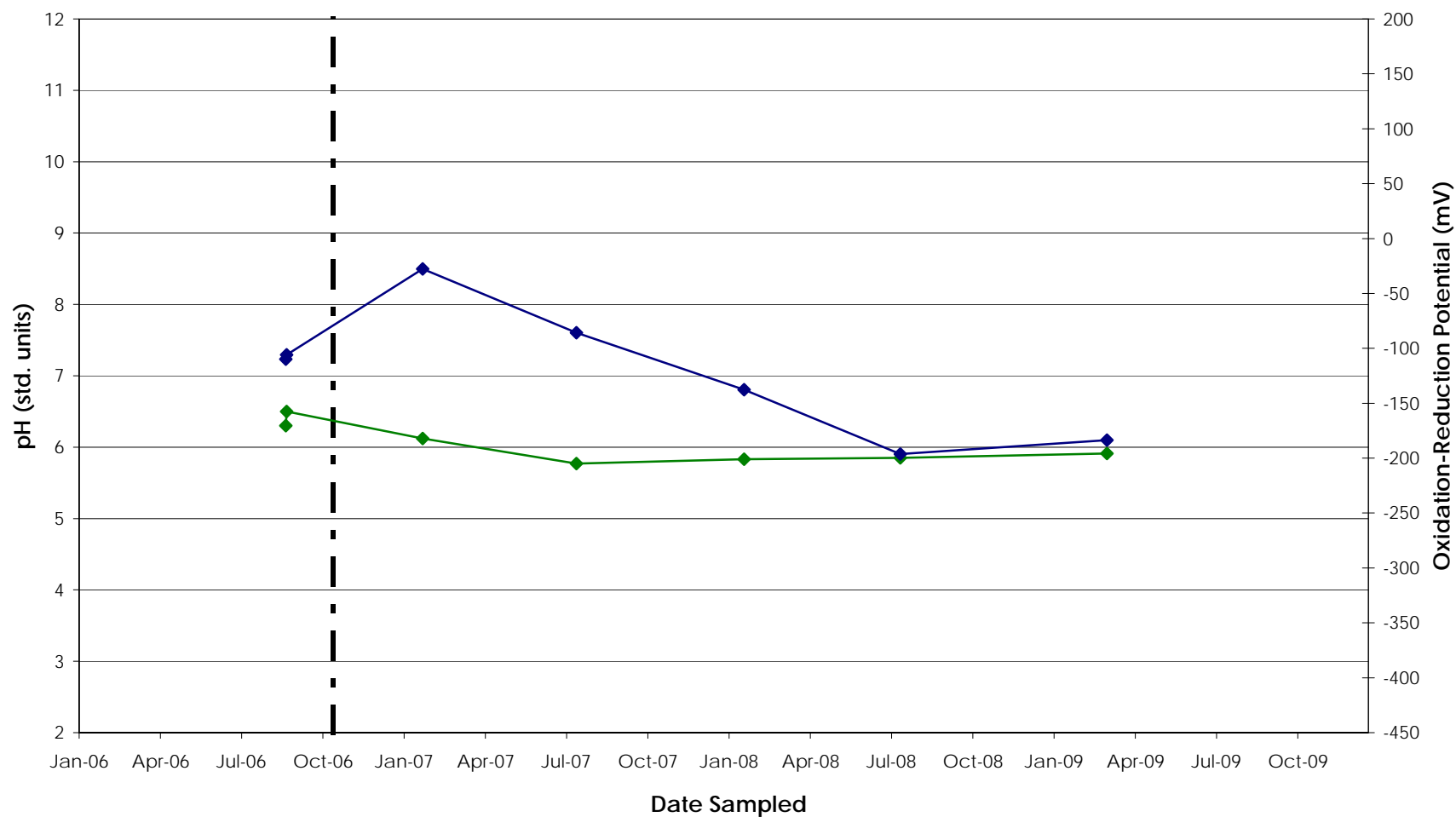
Guelph

November 2009

Figure

E-45

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\GIS\Output\Plot_TrendPlot_20091113.xls\$START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at ML-7-6

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
consultants

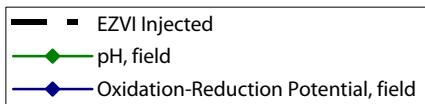
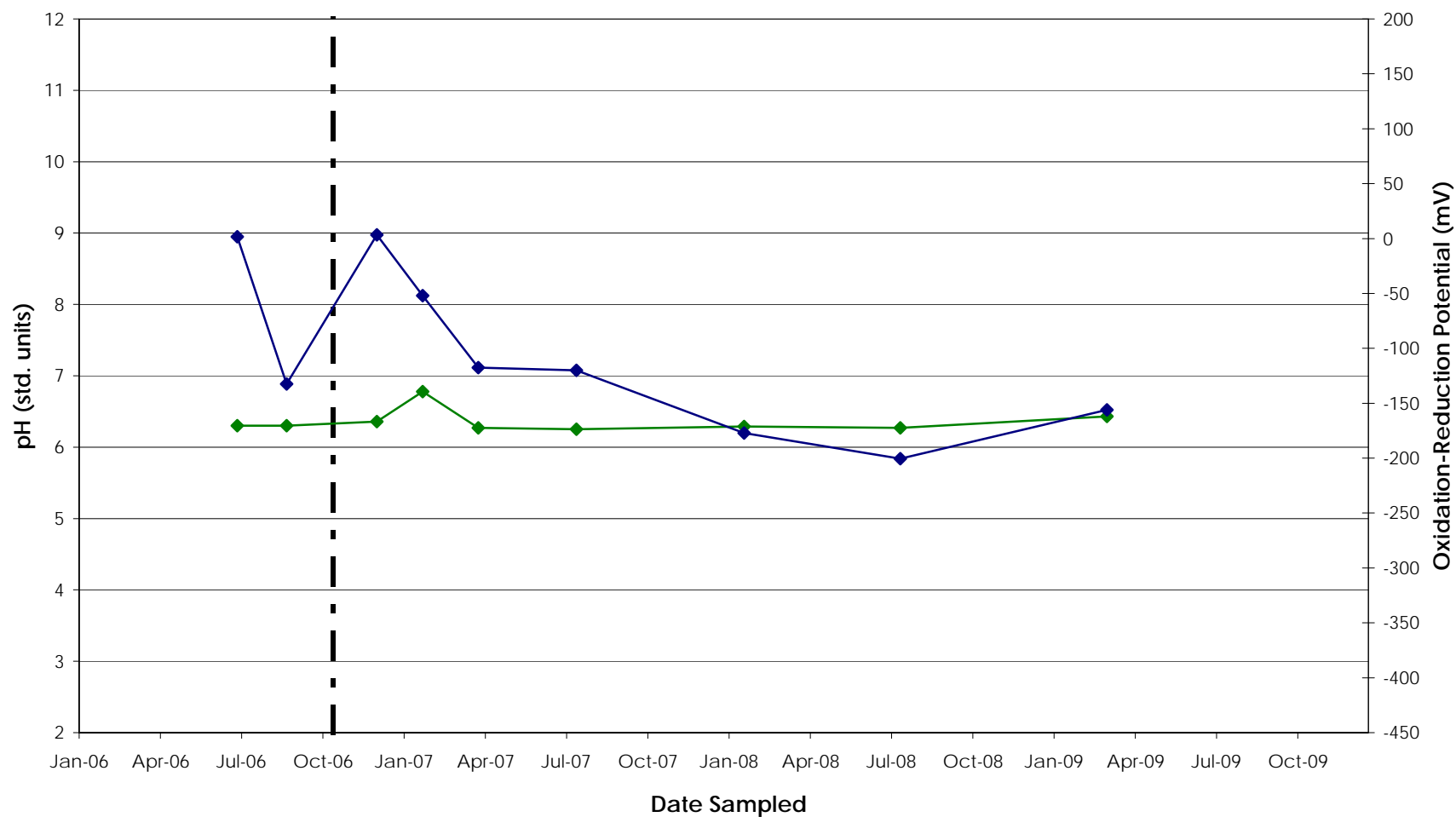
Guelph

November 2009

Figure

E-46

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\Data base&GIS\Output\Plot_TrendPlot_20091113.xls\START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at ML-7-7

Site 45, Parris Island MCRD, Parris Island, SC

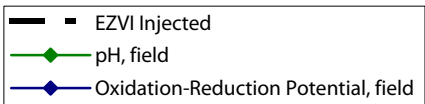
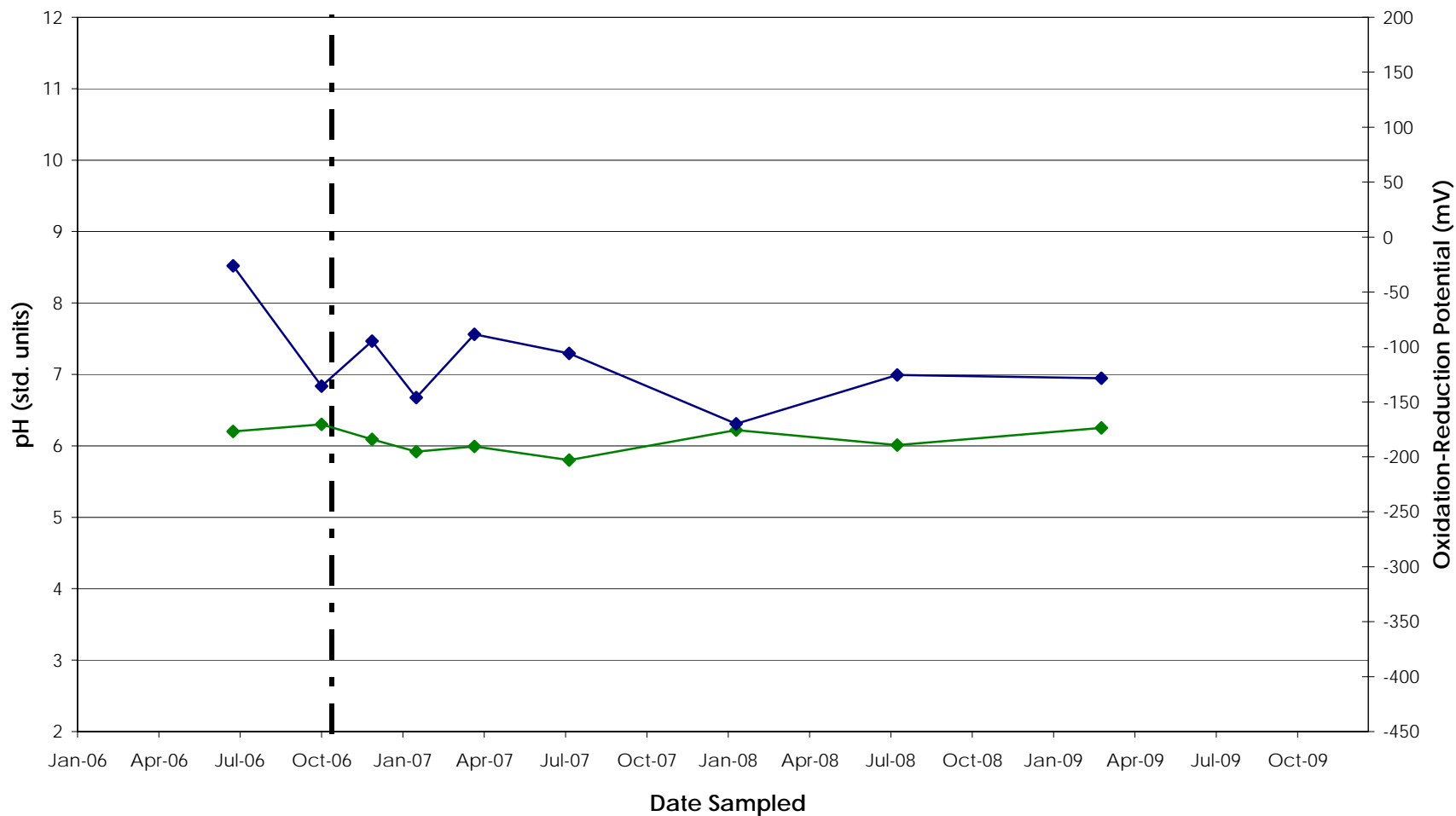
Geosyntec
consultants

Guelph

November 2009

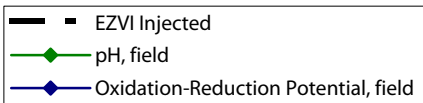
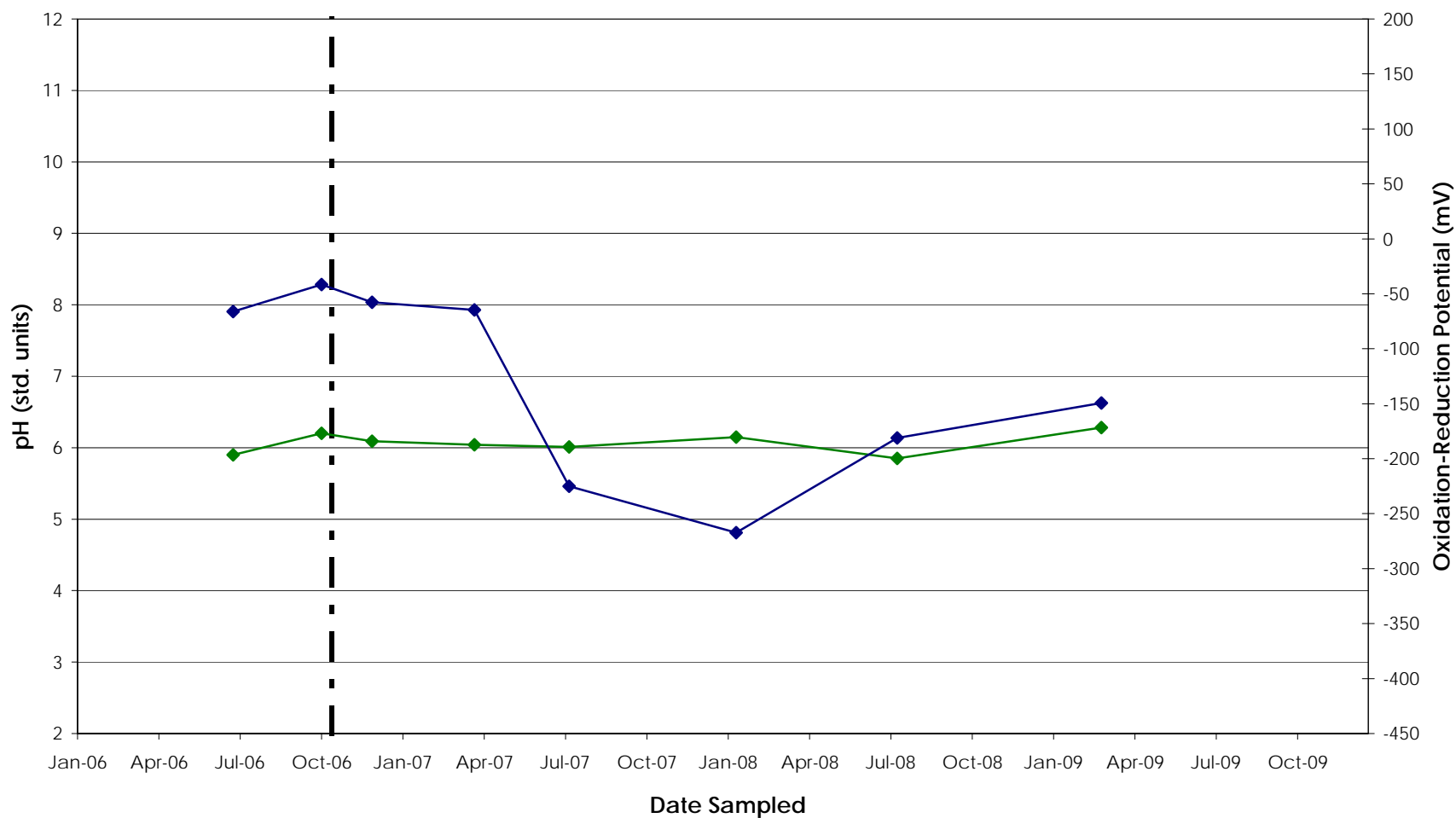
Figure

E-47



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at PMW-1 Site 45, Parris Island MCRD, Parris Island, SC		
		Figure
Guelph	November 2009	E-48



Notes:
 mV - millivolts
 std. units - standard units

ORP and pH Trends at PMW-2

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
 consultants

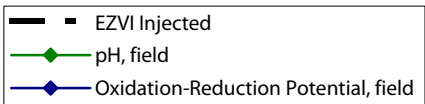
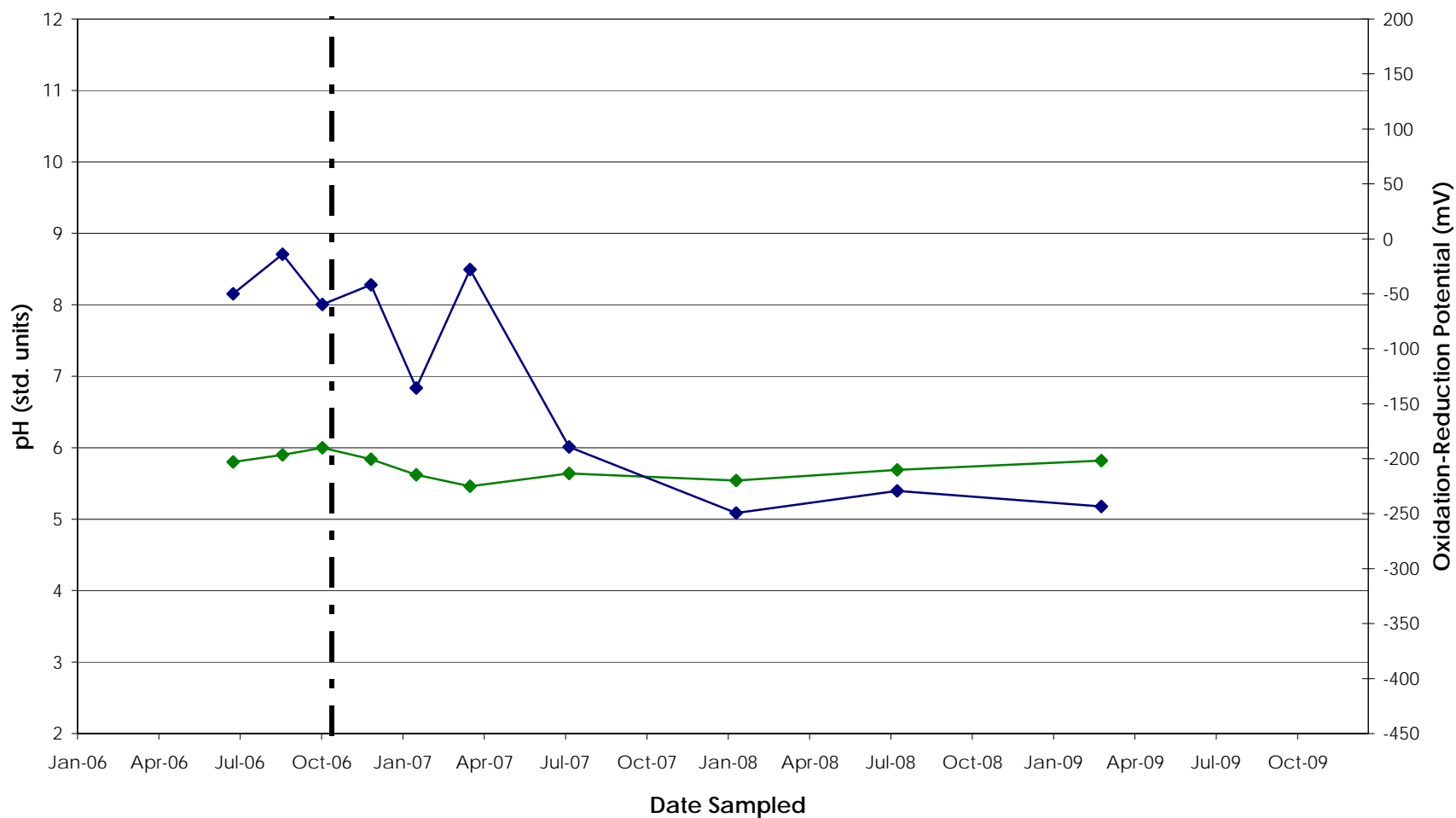
Guelph

November 2009

Figure

E-49

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\GIS\Output\Plot_TrendPlot_20091113.xls\$START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at PMW-3

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
consultants

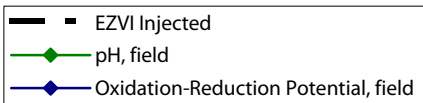
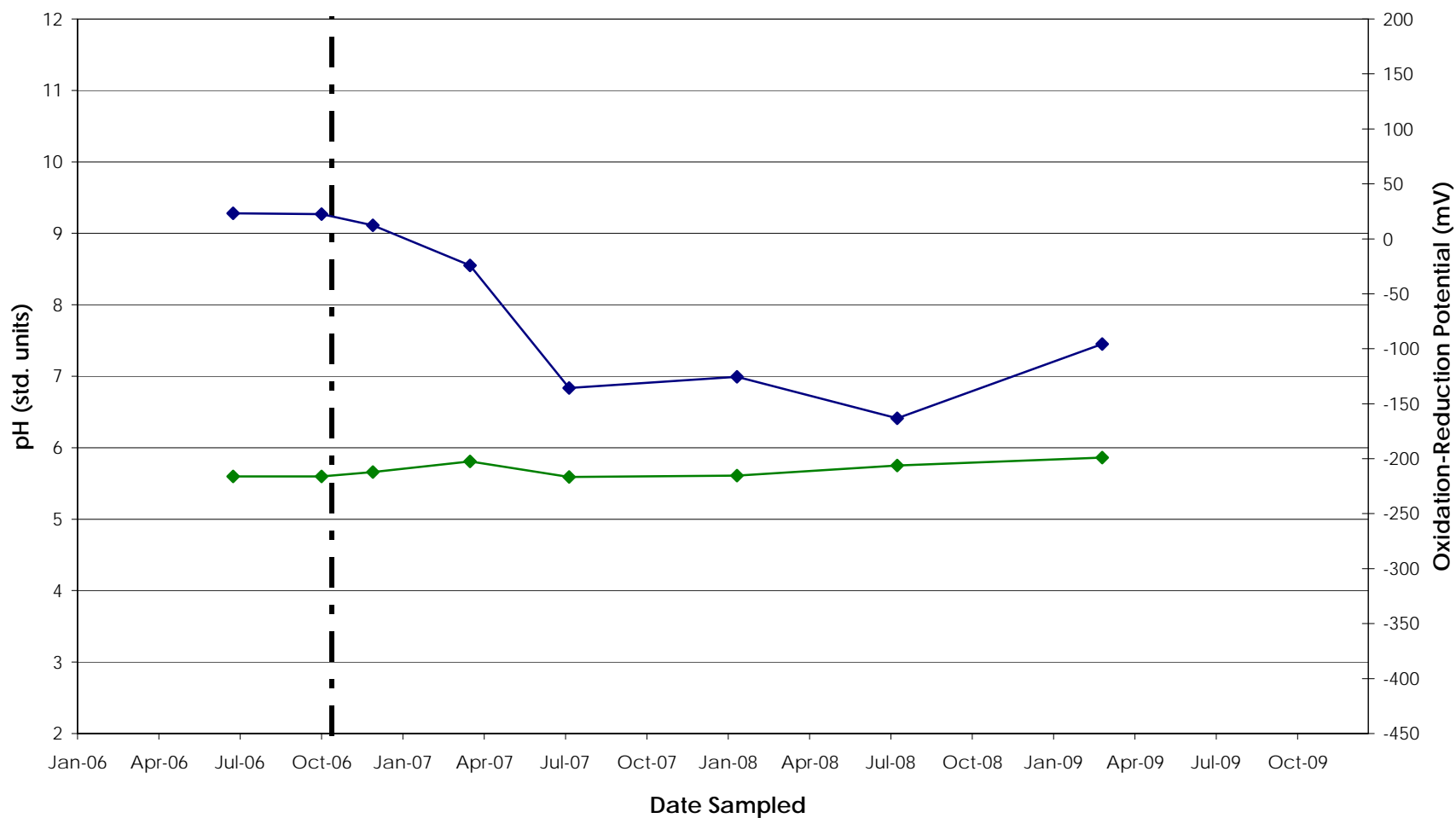
Guelph

November 2009

Figure

E-50

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\Data base&GIS\Output\Plot_TrendPlot_20091113.xls\START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at PMW-4

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
consultants

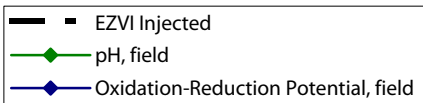
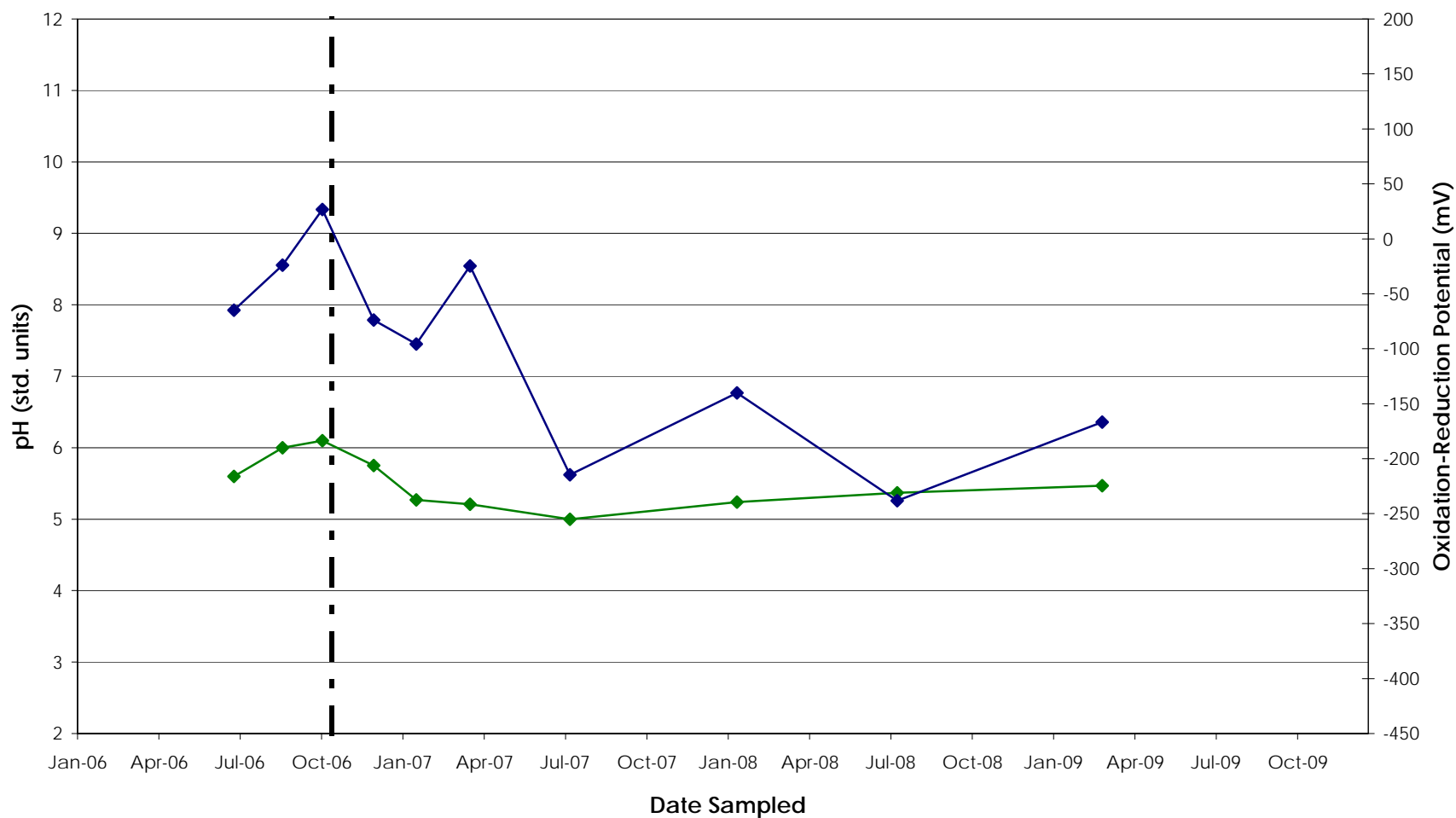
Guelph

November 2009

Figure

E-51

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\GIS\Output\NFP TimeTrendPlot_20091113.k81\$START



Notes:
mV - millivolts
std. units - standard units

ORP and pH Trends at PMW-5

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
consultants

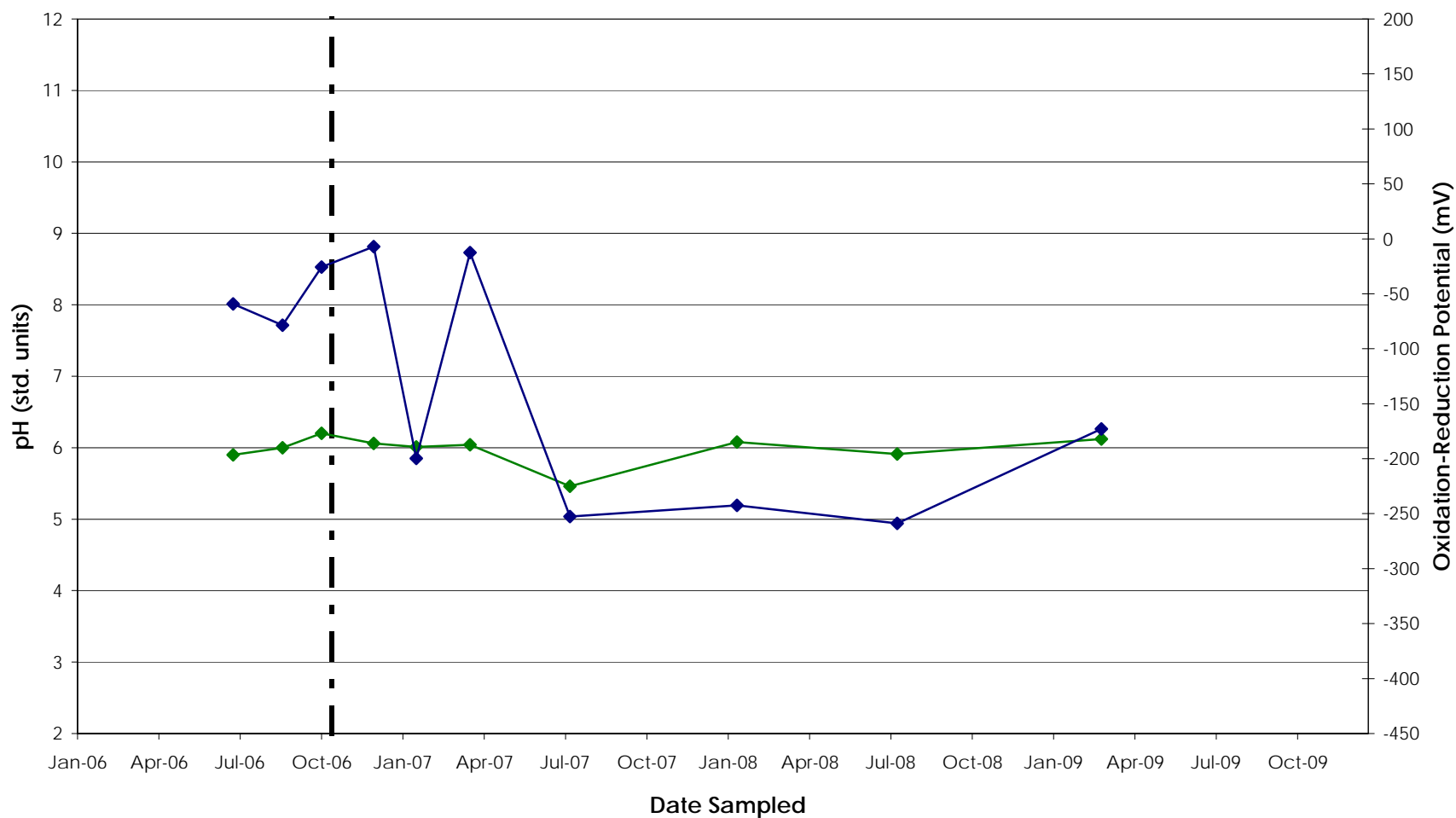
Guelph

November 2009

Figure

E-52

P:\PRJ\Projects\TR0713_ESTCP_EZVI_Demo\Task 1 - Site Selection Startup\Parris Island\GIS\Output\Plot_TrendPlot_20091113.xls\$START



ORP and pH Trends at PMW-6

Site 45, Parris Island MCRD, Parris Island, SC

Geosyntec
consultants

Guelph

November 2009

Figure

E-53

DATA COLLECTED BY USEPA

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

07/17/06

Technical Directive:

3GP894HW

Analyst:

Kristie Hargrove

				Analytes		Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)			
				Codes		7440-44-0-TIC		7440-44-0-TOC			
				Methods		RSKSOP-265 Rev. 1		RSKSOP-265 Rev. 1			
				Unit		mg/L		mg/L			
				MDL		0.473		0.020			
				QL		20.0		20.0			
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF
Field Blank	3446-1	6/26/2006	7/6-7/11/06	BQL (0.498)	1	ND	1				
PMW-1	3446-2	6/26/2006	7/6-7/11/06	54.2	1	BQL (10.9)	1				
PMW-2	3446-3	6/26/2006	7/6-7/11/06	65.5	1	BQL (18.9)	1				
PMW-6	3446-4	6/26/2006	7/6-7/11/06	56.8	1	BQL (15.1)	1				
PMW-3	3446-5	6/26/2006	7/6-7/11/06	63.6	1	23.8	1				
PMW-4	3446-6	6/26/2006	7/6-7/11/06	61.9	1	BQL (18.6)	1				
PMW-5	3446-7	6/27/2006	7/6-7/11/06	62.3	1	BQL (16.0)	1				
ML1-3	3446-8	6/27/2006	7/6-7/11/06	40.5	1	BQL (18.2)	1				
ML1-3	3446-8 LAB DUP	6/27/2006	7/6-7/11/06	40.6 (RPD=0.247)	1	BQL(18.1) (RPD=NA)	1				
ML1-5	3446-9	6/27/2006	7/6-7/11/06	37.6	1	62.0	1				
ML1-7	3446-10	6/27/2006	7/6-7/11/06	BQL (17.1)	1	BQL (21.7)	2				
ML2-3	3446-11	6/27/2006	7/6-7/11/06	BQL (26.9)	2	62.0	1				
ML2-5	3446-12	6/27/2006	7/6-7/11/06	73.3	1	49.3	1				
ML2-7	3446-13	6/27/2006	7/6-7/11/06	45.8	1	89.9	1				
ML3-3	3446-14	6/27/2006	7/6-7/11/06	69.4	1	66.0	1				
ML3-5	3446-15	6/27/2006	7/6-7/11/06	72.8	1	31.4	1				
ML3-7	3446-16	6/27/2006	7/6-7/11/06	54.5	1	39.6	1				
ML3-7 Dup	3446-17	6/27/2006	7/6-7/11/06	54.4	1	40.1	1				
ML4-3	3446-18	6/28/2006	7/6-7/11/06	84.9	1	53.0	1				
ML4-3	3446-18 LAB DUP	6/28/2006	7/6-7/11/06	84.7 (RPD=0.236)	1	53.1 (RPD=0.189)	1				
ML4-5	3446-19	6/28/2006	7/6-7/11/06	75.6	1	45.2	1				
ML4-7	3446-20	6/28/2006	7/6-7/11/06	81.0	1	54.0	1				
ML5-3	3446-21	6/28/2006	7/6-7/11/06	75.4	1	48.9	1				
ML5-5	3446-22	6/28/2006	7/6-7/11/06	63.3	1	38.9	1				
ML5-7	3446-23	6/28/2006	7/6-7/11/06	41.3	1	76.9	1				
ML6-3	3448-1	6/28/2006	7/6-7/11/06	79.8	1	56.7	1				
ML6-5	3448-2	6/28/2006	7/6-7/11/06	81.2	1	50.5	1				

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

07/17/06

Technical Directive:

3GP894HW

Analyst:

Kristie Hargrove

Analyst:	Kristie Hargrove		Analynes	Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)					
			Codes	7440-44-0-TIC		7440-44-0-TOC					
			Methods	RSKSOP-265 Rev. 1		RSKSOP-265 Rev. 1					
			Unit	mg/L		mg/L					
			MDL	0.473		0.020					
			QL	20.0		20.0					
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF
ML6-7	3448-3	6/28/2006	7/6-7/11/06	32.4	1	90.0	1				
ML7-3	3448-4	6/29/2006	7/6-7/11/06	91.7	1	95.5	1				
ML7-5	3448-5	6/29/2006	7/6-7/11/06	70.4	1	BQL (24.1)	2				
ML7-7	3448-6	6/29/2006	7/6-7/11/06	BQL (15.7)	2	58.8	1				
ML7-7	3448-6 LAB DUP	6/29/2006	7/6-7/11/06	BQL (15.4) (RPD=NA)	2	59.1 (RPD=0.509)	1				
ML7-2	3448-7	6/29/2006	7/6-7/11/06	75.7	1	41.6	1				
ML5-2	3448-8	6/29/2006	7/6-7/11/06	42.5	1	26.4	1				
ML3-2	3448-9	6/29/2006	7/6-7/11/06	44.7	1	27.9	1				
ML1-2	3455-1	6/29/2006	7/6-7/11/06	BQL (15.2)	2	44.1	1				
ML2-2	3455-2	6/29/2006	7/6-7/11/06	41.8	1	BQL (11.4)	2				
ML2-2	3455-2 LAB DUP	6/29/2006	7/6-7/11/06	41.5 (RPD=0.720)	1	BQL (11.7) (RPD=NA)	2				

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set. *MDL and QL should be raised by the same factor as the dilution factor for those samples that were diluted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all; NA means not applicable; NSF means not sufficient amount for analyses. All the results are corrected with dilution factors (DF), if applicable.
2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

07/27/06

Technical Directive:

3GP894HW

Analyst:

Lynda Callaway

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Analytes		Chloride (Cl)		Bromide (Br)		Nitrite-N (NO ₂ -N)		Sulfate (as SO ₄)		Nitrate-N (NO ₃ -N)		Fluoride (F)	
				Codes		16887-00-6		7726-95-6-BR		14797-65-0		14808-79-8		14797-55-8		7782-41-4	
				Methods		RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288	
				Unit		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
				MDL		0.263		0.080		0.098		0.298		0.066		0.095	
				QL		1.00		1.00		0.200		1.00		0.200		0.500	
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Field Blank	3446-1	6/26/2006	7/13 - 7/24/2006	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
PMW-1	3446-2	6/26/2006	7/13 - 7/24/2006	45.9	2	ND	1	ND	1	26.5	2	ND	1	ND	1	ND	1
PMW-2	3446-3	6/26/2006	7/13 - 7/24/2006	34.2	1	BQL (0.469)	1	ND	1	44.6	1	ND	1	BQL (0.195)	1	BQL (0.195)	1
PMW-6	3446-4	6/26/2006	7/13 - 7/24/2006	49.0	1	BQL (0.730)	1	ND	1	41.7	1	ND	1	BQL (0.245)	1	BQL (0.245)	1
PMW-3	3446-5	6/26/2006	7/13 - 7/24/2006	57.6	2	BQL (0.595)	1	ND	1	31.6	1	ND	1	BQL (0.196)	1	BQL (0.196)	1
PMW-4	3446-6	6/26/2006	7/13 - 7/24/2006	38.6	2	BQL (0.671)	1	ND	1	42.0	1	ND	1	BQL (0.124)	1	BQL (0.124)	1
PMW-5	3446-7	6/27/2006	7/13 - 7/24/2006	49.3	1	BQL (0.583)	1	ND	1	32.1	1	ND	1	ND	1	ND	1
PMW-5	3446-7 Lab dup	6/27/2006	7/13 - 7/24/2006	49.7 (RPD=0.808)	1	BQL (0.595)(RPD=NA)	1	ND (RPD=NA)	1	31.5 (RPD=1.89)	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
ML1-3	3446-8	6/27/2006	7/13 - 7/24/2006	35.7	1	ND	1	ND	1	89.9	11	ND	1	ND	1	ND	1
ML1-5	3446-9	6/27/2006	7/13 - 7/24/2006	87.9	11	ND	1	ND	1	506	11	ND	1	BQL (0.275)	1	BQL (0.275)	1
ML1-7	3446-10	6/27/2006	7/13 - 7/24/2006	104	11	ND	1	ND	1	386	11	ND	1	BQL (0.287)	1	BQL (0.287)	1
ML2-3	3446-11	6/27/2006	7/13 - 7/24/2006	101	11	ND	1	ND	1	307	11	ND	1	BQL (0.414)	1	BQL (0.414)	1
ML2-5	3446-12	6/27/2006	7/13 - 7/24/2006	62.6	11	BQL (0.657)	1	ND	1	230	11	ND	1	BQL (0.372)	1	BQL (0.372)	1
ML2-7	3446-13	6/27/2006	7/13 - 7/24/2006	106	11	ND	1	ND	1	406	11	ND	1	0.668	1	0.668	1
ML3-3	3446-14	6/27/2006	7/13 - 7/24/2006	122	11	BQL (0.356)	1	ND	1	295	11	ND	1	BQL (0.190)	1	BQL (0.190)	1
ML3-5	3446-15	6/27/2006	7/13 - 7/24/2006	36.1	11	BQL (0.430)	1	ND	1	198	11	ND	1	BQL (0.285)	1	BQL (0.285)	1
ML3-5	3446-15 Lab dup	6/27/2006	7/13 - 7/24/2006	37.0 (RPD=2.46)	11	BQL (0.413) (RPD=NA)	1	ND (RPD=NA)	1	201 (RPD=1.50)	11	ND (RPD=NA)	1	BQL(0.258)(RPD=NA)	1	BQL(0.258)(RPD=NA)	1
ML3-7	3446-16	6/27/2006	7/13 - 7/24/2006	86.8	11	ND	1	ND	1	271	11	ND	1	BQL (0.243)	1	BQL (0.243)	1
ML3-7 Duplicate	3446-17	6/27/2006	7/13 - 7/24/2006	84.8	11	ND	1	ND	1	265	11	ND	1	BQL (0.215)	1	BQL (0.215)	1
ML4-3	3446-18	6/28/2006	7/13 - 7/24/2006	99.2	11	ND	1	ND	1	190	11	ND	1	BQL (0.256)	1	BQL (0.256)	1
ML4-5	3446-19	6/28/2006	7/13 - 7/24/2006	60.9	11	BQL (0.333)	1	ND	1	338	11	ND	1	ND	1	ND	1
ML4-7	3446-20	6/28/2006	7/13 - 7/24/2006	94.6	11	ND	1	ND	1	496	11	ND	1	BQL (0.443)	1	BQL (0.443)	1
ML5-3	3446-21	6/28/2006	7/13 - 7/24/2006	136	11	ND	1	ND	1	140	11	ND	1	ND	1	ND	1
ML5-5	3446-22	6/28/2006	7/13 - 7/24/2006	50.2	11	ND	1	ND	1	238	11	ND	1	0.502	1	0.502	1
ML5-7	3446-23	6/28/2006	7/13 - 7/24/2006	93.2	11	ND	1	ND	1	710	21	ND	1	1.47	1	1.47	1
ML5-7	3446-23 Lab dup	6/28/2006	7/13 - 7/24/2006	95.3 (RPD=2.23)	11	ND (RPD=NA)	1	ND (RPD=NA)	1	706 (RPD=0.565)	21	ND (RPD=NA)	1	1.44 (RPD=2.06)	1	1.44 (RPD=2.06)	1
ML6-3	3448-1	6/28/2006	7/13 - 7/24/2006	151	11	BQL (0.719)	1	ND	1	226	11	ND	1	BQL (0.340)	1	BQL (0.340)	1
ML6-5	3448-2	6/28/2006	7/13 - 7/24/2006	144	11	BQL (0.288)	1	ND	1	120	11	ND	1	BQL (0.335)	1	BQL (0.335)	1

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory: General Parameters

Report Date: 07/27/06

Technical Directive: 3GP894HW

Analyst: Lynda Callaway

Analyst:	Lynda Callaway		Analyses	Chloride (Cl)		Bromide (Br)		Nitrite-N (NO ₂ -N)		Sulfate (as SO ₄)		Nitrate-N (NO ₃ -N)		Fluoride (F)	
			Codes	16887-00-6		7726-95-6-BR		14797-65-0		14808-79-8		14797-55-8		7782-41-4	
			Methods	RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288	
			Unit	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
			MDL	0.263		0.080		0.098		0.298		0.066		0.095	
			QL	1.00		1.00		0.200		1.00		0.200		0.500	
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
ML6-7	3448-3	6/28/2006	7/13 - 7/24/2006	91.6	11	ND	1	ND	1	722	21	ND	1	1.23	1
ML7-3	3448-4	6/29/2006	7/13 - 7/24/2006	207	11	BQL (0.520)	1	ND	1	469	11	ND	1	BQL (0.221)	1
ML7-5	3448-5	6/29/2006	7/13 - 7/24/2006	61.2	11	ND	1	ND	1	375	11	ND	1	BQL (0.466)	1
ML7-7	3448-6	6/29/2006	7/13 - 7/24/2006	89.8	11	ND	1	ND	1	504	11	ND	1	0.938	1
ML7-2	3448-7	6/29/2006	7/13 - 7/24/2006	143	11	BQL (0.638)	1	ND	1	61.8	11	ND	1	BQL (0.106)	1
ML5-2	3448-8	6/29/2006	7/13 - 7/24/2006	71.7	11	BQL (0.436)	1	ND	1	62.2	11	ND	1	BQL (0.115)	1
ML3-2	3448-9	6/29/2006	7/13 - 7/24/2006	109	11	BQL (0.420)	1	ND	1	28.1	1	ND	1	BQL (0.166)	1
ML3-2	3448-9 Lab dup	6/29/2006	7/13 - 7/24/2006	109 (RPD=0)	11	BQL(0.551) RPD=NA)	1	ND (RPD=NA)	1	28.4 (RPD=1.06)	1	ND (RPD=NA)	1	BQL (0.161)(RPD=NA)	1
ML1-2	3455-1	6/29/2006	7/13 - 7/24/2006	69.8	6	ND	1	ND	1	325	21	ND	1	ND	1
ML2-2	3455-2	6/29/2006	7/13 - 7/24/2006	101	11	BQL (0.253)	1	ND	1	30.6	1	ND	1	BQL (0.190)	1
ML2-2	3455-2 LAB DUP	6/29/2006	7/13 - 7/24/2006	101 (RPD=0)	11	BQL (0.215)(RPD=NA)	1	ND (RPD=NA)	1	30.0 (RPD=1.98)	1	ND (RPD=NA)	1	BQL (0.191)(RPD=NA)	1

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set within the calibration range. *MDL and QL should be raised by the same factor as the dilution factor for those samples that were diluted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all; NA means not applicable; NSF means not sufficient amount for analyses. All the results are corrected with dilution factors (DF), if applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **7/25/06**

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Technical Directive: **3ME344HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Field Sample ID	FIELD BLANK	PMW-1	PMW-1	PMW-2	PMW-6	PMW-3
Sample Lab ID	3446-01	3446-02	3446-02 Lab Dup.	3446-03	3446-04	3446-05
Date Collected	6/26/06	6/26/06	6/26/06	6/26/06	6/26/06	6/26/06
Date Analyzed	7/13 & 7/24/06	7/13/06	7/13/06	7/13/06	7/13/06	7/13/06

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	ND	1	24.5	1	24.1 (RPD=1.65)	1	36.7	1	40.3	1	85.7	1
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	ND	1	7.83	1	8.36 (RPD=6.55)	1	14.8	1	13.3	1	13.8	1
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	BQL(0.043)	1	0.637	1	0.621 (RPD=2.54)	1	2.64	1	0.371	1	0.407	1
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	ND	1	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND (RPD=NA)	1	2.31	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	ND	1	3.32	1	3.08 (RPD=7.50)	1	10.4	1	7.79	1	8.56	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND	1	0.822	1	0.826 (RPD=0.49)	1	0.117	1	0.086	1	0.070	1
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	ND	1	11.0	1	11.1 (RPD=0.90)	1	8.48	1	6.39	1	6.92	1
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.033)	1	ND	1

Comments:

No problems noted. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

 Report Date:

7/25/06

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Technical Directive:

3ME344HW

Sample Results (1, 2)

Analysts:

Steve Markham

Method:

RSKSOP 257(1)

Analysts:	Steve Markham		Field Sample ID		PMW-4		PMW-5		ML1-3		ML1-5		ML1-7		ML2-3		
	Sample Lab ID				3446-06		3446-07		3446-08		3446-09		3446-10		3446-11		
Method:	RSKSOP 257(1)		Date Collected		6/26/06		6/27/06		6/27/06		6/27/06		6/27/06		6/27/06		
			Date Analyzed		7/13/06		7/13/06		7/13/06		7/13/06		7/13/06		7/13/06		
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes																
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	24.2	1	40.1	1	12.3	1	10.1	1	2.83	1	54.9	1	
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	15.4	1	9.70	1	6.72	1	6.80	1	3.63	1	10.9	1	
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	0.460	1	0.428	1	6.62	1	1.21	1	0.778	1	0.819	1	
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—	
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND	1	0.219	1	ND	1	ND	1	
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	8.72	1	8.39	1	8.21	1	9.87	1	7.21	1	14.1	1	
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.061	1	0.157	1	0.090	1	0.559	1	0.039	1	5.91	1	
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	8.01	1	7.69	1	7.64	1	11.5	1	10.8	1	4.34	1	
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1	ND	1	ND	1	BQL(0.037)	1	ND	1	ND	1	

Comments:
No problems noted. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 7/25/06

Technical Directive: 3ME344HW

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(1)

Analysts:	Steve Markham				Field Sample ID		ML2-5		ML2-5		ML2-7		ML3-3		ML3-5		ML3-7	
	Sample Lab ID				3446-12		3446-12 Lab Dup.		3446-13		3446-14		3446-15		3446-16			
Method:	RSKSOP 257(1)				Date Collected		6/27/06		6/27/06		6/27/06		6/27/06		6/27/06		6/27/06	
	Date Analyzed				7/13 & 7/17/06		7/13 & 7/17/06		7/13 & 7/17/06		7/13 & 7/17/06		7/13 & 7/17/06		7/13 & 7/17/06			
Analytes				Unit	MDL	QL	Data		DF	Data		DF	Data		DF	Data		DF
Names		Codes																
Arsenic (As)		7440-38-2		µg/L	0.024	0.080	16.6	1	15.8 (RPD=4.94)	1	12.0	1	132	1	20.4	1	7.39	1
Chromium (Cr)		7440-47-3		µg/L	0.085	0.317	10.8	1	10.1 (RPD=6.70)	1	7.47	1	15.7	1	14.9	1	10.8	1
Copper (Cu)		7440-50-8		µg/L	0.031	0.104	0.542	1	0.518 (RPD=4.53)	1	0.886	1	0.863	1	0.374	1	0.588	1
Iron (Fe)		7439-89-6		µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)		7439-92-1		µg/L	0.018	0.060	0.226	1	0.209 (RPD=7.82)	1	ND	1	0.097	1	0.120	1	BQL(0.022)	1
Selenium (Se)		7782-49-2		µg/L	0.183	0.610	12.6	1	12.1 (RPD=4.05)	1	12.0	1	12.6	1	9.60	1	8.24	1
Uranium (U)		7440-61-1		µg/L	0.002	0.007	2.20	1	2.03 (RPD=8.04)	1	3.31	1	4.05	1	0.522	1	0.422	1
Zinc (Zn)		7440-62-2		µg/L	0.111	0.370	8.85	1	9.05 (RPD=2.23)	1	3.93	1	4.63	1	2.32	1	5.98	1
Mercury (Hg)		7439-97-6		µg/L	0.030	0.100	BQL(0.052)	1	BQL(0.037) (RPD=NA)	1	BQL(0.039)	1	ND	1	ND	1	BQL(0.033)	1

Comments:
No problems noted. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit. BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **7/25/06**

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Technical Directive: **3ME344HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Analytes		Unit	MDL		QL		Data		DF		Data		DF		Data		DF		Data		DF		Data		DF		Data		DF	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	8.13	1	116	1	18.5	1	6.15	1	246	1	13.8	1														
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	10.7	1	19.4	1	14.3	1	15.2	1	24.4	1	13.1	1														
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	0.654	1	0.769	1	0.844	1	1.56	1	0.887	1	0.664	1														
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—														
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	BQL(0.028)	1	ND	1	ND	1	ND	1														
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	9.13	1	11.6	1	11.3	1	9.45	1	10.1	1	11.1	1														
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.497	1	7.05	1	5.78	1	51.9	1	1.82	1	0.477	1														
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	7.05	1	10.6	1	3.25	1	4.46	1	9.98	1	3.38	1														
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1														

Comments:
 No problems noted. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Laboratory: **Metals** Report Date: **7/25/06**

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Technical Directive: **3ME344HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Field Sample ID	ML5-7					
Sample Lab ID	3446-23					
Date Collected	6/28/06					
Date Analyzed	7/13 & 7/17/06					

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	7.40	1										
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	22.1	1										
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	0.996	1										
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—										
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	0.066	1										
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	7.97	1										
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.213	1										
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	7.32	1										
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1										

Comments:
 No problems noted. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive:

3ME344HW

Sample Results (1, 2)

Analysts:

Steve Markham

Method:

RSKSOP 257(1)

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	280	1	276 (RPD=1.44)	1	294	1	9.61	1	235	1	15.0	1
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	19.6	1	19.8 (RPD=1.02)	1	13.4	1	8.81	1	20.6	1	19.2	1
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	1.16	1	1.07 (RPD=8.07)	1	0.906	1	1.32	1	2.83	1	0.667	1
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	BQL(0.040)	1	BQL(0.027) (RPD=NA)	1	ND	1	BQL(0.032)	1	BQL(0.029)	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	10.7	1	10.1 (RPD=5.77)	1	9.59	1	8.98	1	15.4	1	12.0	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	10.4	1	10.0 (RPD=3.92)	1	5.55	1	0.259	1	12.5	1	3.57	1
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	6.31	1	6.31 (RPD=0.00)	1	5.97	1	4.48	1	5.87	1	3.24	1
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	BQL(0.041)	1	ND (RPD=NA)	1	ND	1	BQL(0.042)	1	ND	1	ND	1

Comments:

No problems noted. All iron results were above the QL for ICP analysis, thus iron was not analyzed by ICP-MS. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive:

3ME344HW

Sample Results (1, 2)

Analysts:	Steve Markham		Field Sample ID		ML7-7		ML7-2		ML5-2		ML3-2		ML1-2		ML1-2			
			Sample Lab ID		3448-06		3448-07		3448-08		3448-09		3455-01		3455-01 Lab Dup.			
			Date Collected		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06			
			Date Analyzed		7/12/06		7/12/06		7/12/06		7/12/06		7/12/06		7/12/06			
Method:	RSKSOP 257(1)		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
	Names	Codes																
	Arsenic (As)		7440-38-2	µg/L	0.024	0.080	6.37	1	12.1	1	8.57	1	36.5	1	14.7	1	14.9 (RPD=1.35)	1
	Chromium (Cr)		7440-47-3	µg/L	0.085	0.317	4.05	1	17.7	1	8.82	1	10.9	1	9.07	1	9.45 (RPD=4.10)	1
	Copper (Cu)		7440-50-8	µg/L	0.031	0.104	0.990	1	0.801	1	0.853	1	1.35	1	0.995	1	0.988 (RPD=0.71)	1
	Lead (Pb)		7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND	1	0.160	1	0.095	1	0.071 (RPD=28.92)	1
	Selenium (Se)		7782-49-2	µg/L	0.183	0.610	8.59	1	11.8	1	7.45	1	8.24	1	9.03	1	8.78 (RPD=2.81)	1
	Uranium (U)		7440-61-1	µg/L	0.002	0.007	1.42	1	0.735	1	0.064	1	0.105	1	0.484	1	0.457 (RPD=5.74)	1
	Zinc (Zn)		7440-62-2	µg/L	0.111	0.370	2.93	1	4.83	1	6.01	1	7.75	1	7.02	1	7.28 (RPD=3.64)	1
	Mercury (Hg)		7439-97-6	µg/L	0.030	0.100	ND	1	ND	1	ND	1	ND	1	BQL(0.036)	1	ND (RPD=NA)	1

Comments:

No problems noted. All iron results were above the QL for ICP analysis, thus iron was not analyzed by ICP-MS. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: 3ME344HW

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(1)

Analysts:	Steve Markham		Field Sample ID		ML2-2												
			Sample Lab ID		3455-02												
Method:	RSKSOP 257(1)		Date Collected		6/29/06												
			Date Analyzed		7/12/06												
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes																
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	24.2	1											
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	11.1	1											
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	0.831	1											
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	BQL(0.043)	1											
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	8.86	1											
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.462	1											
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	3.51	1											
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1											

Comments:
No problems noted. All iron results were above the QL for ICP analysis, thus iron was not analyzed by ICP-MS. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive:

3ME344HW

Sample Results (1, 2)

Analysts:

Steve. Markham

Method:

RSKSOP 213(2)

Analytes		Unit	MDL	QL	FIELD BLANK		PMW-1		PMW-1		PMW-2		PMW-6		PMW-3	
Names	Codes				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	ND	1	0.036	1	0.036 (RPD=0.00)	1	0.048	1	0.051	1	0.097	1
Boron (B)	7440-42-8	mg/L	0.013	0.044	ND	1	0.086	1	0.085 (RPD=1.17)	1	0.154	1	0.147	1	0.178	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	ND	1	0.127	1	0.126 (RPD=0.79)	1	0.039	1	0.062	1	0.064	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.002)	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	BQL(0.028)	1	56.4	1	56.1 (RPD=0.53)	1	34.7	1	24.2	1	21.9	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.002)	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.002)	1	BQL(0.001)	1
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	ND	1	19.7	1	19.7 (RPD=0.00)	1	6.00	1	14.1	1	26.3	1
Potassium (K)	7440-09-7	mg/L	0.055	0.184	ND	1	3.08	1	3.11 (RPD=0.97)	1	0.953	1	0.994	1	1.02	1
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	ND	1	8.32	1	8.32 (RPD=0.00)	1	9.75	1	10.7	1	12.7	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	ND	1	0.275	1	0.273 (RPD=0.73)	1	0.094	1	0.094	1	0.079	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	0.004	1	BQL(0.004) (RPD=NA)	1	BQL(0.003)	1	0.005	1	BQL(0.003)	1
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	ND	1	14.7	1	14.7 (RPD=0.00)	1	46.7	1	42.7	1	45.9	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.003)	1	BQL(0.002)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	ND	1	BQL(0.005)	1	BQL(0.006) (RPD=NA)	1	BQL(0.004)	1	BQL(0.006)	1	BQL(0.007)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	ND	1	0.018	1	0.019 (RPD=5.41)	1	0.020	1	0.018	1	0.021	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	ND	1	0.229	1	0.227 (RPD=0.88)	1	0.160	1	0.138	1	0.135	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	0.004	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1	BQL(0.016)	1	BQL(0.015) (RPD=NA)	1	BQL(0.010)	1	BQL(0.008)	1	BQL(0.008)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.004)	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	BQL(0.015)	1	BQL(0.016) (RPD=NA)	1	BQL(0.009)	1	BQL(0.013)	1	BQL(0.011)	1
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	BQL(0.101)	1	5.21	1	5.18 (RPD=0.58)	1	14.9	1	15.2	1	14.6	1
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	ND	1	9.04	1	9.13 (RPD=0.99)	1	15.1	1	14.2	1	11.4	1
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	ND	1	ND	1	ND (RPD=NA)	1	0.816	1	0.821	1	0.899	1
Uranium (U)	7440-61-1	mg/L	0.007	0.024	0.0313	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. " - " denotes that the information is not available or the analyte is not analyzed.

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Technical Directive:

3ME344HW

Sample Results (1, 2)

Analysts:

Steve. Markham

Method:

RSKSOP 213(2)

Analysts:	Steve. Markham	Field Sample ID		PMW-4		PMW-5		ML1-3		ML1-5		ML1-7		ML2-3		
		Sample Lab ID		3446-06		3446-07		3446-08		3446-09		3446-10		3446-11		
		Date Collected		6/26/06		6/27/06		6/27/06		6/27/06		6/27/06		6/27/06		
		Date Analyzed		7/11/06		7/11/06		7/11/06		7/11/06		7/11/06		7/11/06		
Method:	RSKSOP 213(2)	Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
		mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		mg/L	0.036	0.120	ND	1	ND	1	ND	1	BQL(0.104)	1	ND	1	ND	1
		mg/L	0.005	0.017	0.033	1	0.049	1	0.019	1	BQL(0.016)	1	BQL(0.008)	1	0.061	1
		mg/L	0.013	0.044	0.145	1	0.150	1	0.126	1	0.164	1	0.114	1	0.184	1
		mg/L	0.001	0.004	0.069	1	0.051	1	0.088	1	0.100	1	0.063	1	0.058	1
		mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		mg/L	0.024	0.080	18.9	1	23.4	1	34.8	1	32.3	1	23.4	1	40.9	1
		mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		mg/L	0.001	0.004	ND	1	BQL(0.003)	1	BQL(0.002)	1	BQL(0.001)	1	ND	1	ND	1
		mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		mg/L	0.005	0.017	ND	1	ND	1	BQL(0.006)	1	ND	1	ND	1	ND	1
		mg/L	0.005	0.017	9.91	1	6.57	1	4.54	1	2.87	1	0.793	1	1.75	1
		mg/L	0.055	0.184	1.22	1	1.81	1	2.91	1	3.04	1	2.66	1	2.87	1
		mg/L	0.024	0.080	7.51	1	8.30	1	8.04	1	6.56	1	3.19	1	8.41	1
		mg/L	0.001	0.004	0.098	1	0.122	1	0.315	1	0.212	1	0.138	1	0.228	1
		mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.003)	1	BQL(0.004)	1	0.009	1	0.006	1	0.017	1
		mg/L	0.042	0.140	48.6	1	46.5	1	145	1	291	10	227	1	230	1
		mg/L	0.003	0.010	ND	1	BQL(0.004)	1	ND	1	ND	1	ND	1	ND	1
		mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		mg/L	0.003	0.010	BQL(0.004)	1	ND	1	BQL(0.005)	1	BQL(0.004)	1	BQL(0.004)	1	BQL(0.006)	1
		mg/L	0.003	0.010	0.017	1	0.016	1	0.013	1	0.014	1	0.011	1	0.020	1
		mg/L	0.001	0.004	0.104	1	0.121	1	0.194	1	0.202	1	0.114	1	0.262	1
		mg/L	0.001	0.004	ND	1	ND	1	ND	1	BQL(0.002)	1	ND	1	ND	1
		mg/L	0.005	0.017	BQL(0.006)	1	BQL(0.005)	1	BQL(0.010)	1	BQL(0.012)	1	BQL(0.010)	1	BQL(0.013)	1
		mg/L	0.002	0.007	BQL(0.003)	1	BQL(0.002)	1	ND	1	ND	1	ND	1	BQL(0.005)	1
		mg/L	0.006	0.020	BQL(0.011)	1	BQL(0.012)	1	BQL(0.009)	1	BQL(0.014)	1	BQL(0.013)	1	BQL(0.008)	1
		mg/L	0.044	0.147	13.9	1	15.7	1	7.48	1	6.84	1	7.73	1	9.27	1
		mg/L	0.092	0.307	14.8	1	12.0	1	82.6	1	211	1	139	1	104	1
		mg/L	0.011	0.037	0.504	1	0.555	1	ND	1	BQL(0.028)	1	BQL(0.020)	1	BQL(0.030)	1
		mg/L	0.007	0.024	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. * -* denotes that the information is not available or the analyte is not analyzed.

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Sample Results (1, 2)

Analysts:	Steve. Markham			Field Sample ID		ML2-5		ML2-5		ML2-7		ML3-3		ML3-5		ML3-7	
				Sample Lab ID		3446-12		3446-12 Lab Dup.		3446-13		3446-14		3446-15		3446-16	
				Date Collected		6/27/06		6/27/06		6/27/06		6/27/06		6/27/06		6/27/06	
				Date Analyzed		7/11/06		7/11/06		7/11/06		7/11/06		7/11/06		7/11/06	
Method:	RSKSOP 213(2)			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Analytes																	
Names		Codes															
Silver (Ag)		7440-22-4	mg/L	0.003	0.010	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)		7429-90-5	mg/L	0.036	0.120	0.124	1	0.164 (RPD=27.78)	1	ND	1	ND	1	ND	1	BQL(0.064)	1
Arsenic (As)		7440-38-2	mg/L	0.005	0.017	0.027	1	0.025 (RPD=7.69)	1	0.019	1	0.130	1	0.032	1	0.018	1
Boron (B)		7440-42-8	mg/L	0.013	0.044	0.198	1	0.203 (RPD=2.49)	1	0.197	1	0.162	1	0.195	1	0.144	1
Barium (Ba)		7440-39-3	mg/L	0.001	0.004	0.022	1	0.022 (RPD=0.00)	1	0.016	1	0.068	1	0.018	1	0.043	1
Beryllium (Be)		7440-41-7	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)		7440-70-2	mg/L	0.024	0.080	18.0	1	18.0 (RPD=0.00)	1	17.2	1	44.8	1	15.9	1	24.0	1
Cadmium (Cd)		7440-43-9	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Cobalt (Co)		7440-48-4	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)		7440-47-3	mg/L	0.001	0.004	ND	1	BQL(0.001) (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)		7440-50-8	mg/L	0.005	0.017	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)		7439-89-6	mg/L	0.005	0.017	2.39	1	2.37 (RPD=0.84)	1	0.353	1	7.85	1	2.55	1	1.96	1
Potassium (K)		7440-09-7	mg/L	0.055	0.184	1.07	1	1.03 (RPD=3.81)	1	1.98	1	2.94	1	1.21	1	2.59	1
Magnesium (Mg)		7439-95-4	mg/L	0.024	0.080	4.40	1	4.36 (RPD=0.91)	1	2.25	1	11.5	1	3.01	1	3.99	1
Manganese (Mn)		7439-96-5	mg/L	0.001	0.004	0.058	1	0.059 (RPD=1.71)	1	0.059	1	0.345	1	0.085	1	0.144	1
Molybdenum (Mo)		7439-98-7	mg/L	0.001	0.004	0.008	1	0.008 (RPD=0.00)	1	0.013	1	0.012	1	0.005	1	0.004	1
Sodium (Na)		7440-23-5	mg/L	0.042	0.140	180	1	179 (RPD=0.56)	1	275	1	223	1	165	1	187	1
Nickel (Ni)		7440-02-0	mg/L	0.003	0.010	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)		7439-92-1	mg/L	0.002	0.007	ND	1	ND (RPD=NA)	1	BQL(0.003)	1	ND	1	ND	1	ND	1
Antimony (Sb)		7440-36-0	mg/L	0.003	0.010	BQL(0.004)	1	BQL(0.004) (RPD=NA)	1	ND	1	BQL(0.006)	1	ND	1	ND	1
Selenium (Se)		7782-49-2	mg/L	0.003	0.010	0.020	1	0.017 (RPD=16.22)	1	0.014	1	0.026	1	0.017	1	0.013	1
Strontium (Sr)		7440-24-6	mg/L	0.001	0.004	0.123	1	0.121 (RPD=1.64)	1	0.171	1	0.267	1	0.107	1	0.127	1
Titanium (Ti)		7440-32-6	mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.004) (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)		7440-28-0	mg/L	0.005	0.017	ND	1	BQL(0.006) (RPD=NA)	1	BQL(0.006)	1	BQL(0.009)	1	BQL(0.008)	1	BQL(0.006)	1
Vanadium (V)		7440-62-2	mg/L	0.002	0.007	BQL(0.002)	1	ND (RPD=NA)	1	0.020	1	ND	1	ND	1	ND	1
Zinc (Zn)		7440-66-6	mg/L	0.006	0.020	BQL(0.011)	1	BQL(0.010) (RPD=NA)	1	BQL(0.007)	1	BQL(0.009)	1	ND	1	BQL(0.011)	1
Sillicon (Si)		7440-21-3	mg/L	0.044	0.147	17.1	1	17.2 (RPD=0.58)	1	10.2	1	9.13	1	17.5	1	13.7	1
Sulfur (S)		7704-34-9	mg/L	0.092	0.307	75.0	1	75.9 (RPD=1.19)	1	132	1	99.0	1	70.9	1	85.2	1
Phosphorus (P)		7723-14-0	mg/L	0.011	0.037	1.54	1	1.55 (RPD=0.65)	1	0.045	1	BQL(0.028)	1	1.10	1	0.109	1
Uranium (U)		7440-61-1	mg/L	0.007	0.024	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

- Notes:
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Sample Results (1, 2)

Analysts:

Steve. Markham

Method:

RSKSOP 213(2)

Analysts:	Steve. Markham	Field Sample ID		ML3-7 DUPLICATE		ML4-3		ML4-5		ML4-7		ML5-3		ML5-5				
		Sample Lab ID		3446-17		3446-18		3446-19		3446-20		3446-21		3446-22				
		Date Collected		6/27/06		6/28/06		6/28/06		6/28/06		6/28/06		6/28/06				
		Date Analyzed		7/11/06		7/11/06		7/11/06		7/11/06		7/11/06		7/11/06				
Method:	RSKSOP 213(2)	Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF		
		Names	Codes															
		Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1		
		Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND	1	ND	1	ND	1	ND	1	BQL(0.039)	1
		Arsenic (As)	7440-38-2	mg/L	0.005	0.017	BQL(0.016)	1	0.126	1	0.028	1	0.022	1	0.264	1	0.026	1
		Boron (B)	7440-42-8	mg/L	0.013	0.044	0.144	1	0.157	1	0.194	1	0.178	1	0.153	1	0.188	1
		Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.042	1	0.073	1	0.037	1	0.054	1	0.096	1	0.036	1
		Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	23.1	1	39.7	1	32.9	1	50.3	1	46.0	1	21.2	1
		Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	BQL(0.001)	1	ND	1
		Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		Iron (Fe)	7439-89-6	mg/L	0.005	0.017	1.88	1	30.1	1	5.16	1	0.929	1	45.1	1	2.35	1
		Potassium (K)	7440-09-7	mg/L	0.055	0.184	2.58	1	1.41	1	1.51	1	2.46	1	1.38	1	1.91	1
		Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	3.86	1	21.3	1	9.76	1	17.2	1	23.9	1	5.15	1
		Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.140	1	0.243	1	0.130	1	0.129	1	0.283	1	0.163	1
		Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.005	1	0.007	1	0.008	1	0.012	1	0.009	1	0.006	1
		Sodium (Na)	7440-23-5	mg/L	0.042	0.140	191	1	159	1	235	1	342	10	123	10	174	10
		Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	ND	1	BQL(0.006)	1	BQL(0.005)	1	BQL(0.007)	1	BQL(0.007)	1	BQL(0.005)	1
		Selenium (Se)	7782-49-2	mg/L	0.003	0.010	0.013	1	0.026	1	0.023	1	0.024	1	0.025	1	0.017	1
		Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.122	1	0.268	1	0.201	1	0.240	1	0.309	1	0.146	1
		Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.008)	1	BQL(0.012)	1	BQL(0.008)	1	BQL(0.009)	1	BQL(0.012)	1	BQL(0.005)	1
		Vanadium (V)	7440-62-2	mg/L	0.002	0.007	ND	1	ND	1	BQL(0.005)	1	BQL(0.005)	1	ND	1	ND	1
		Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	BQL(0.009)	1	BQL(0.012)	1	BQL(0.007)	1	BQL(0.009)	1	BQL(0.011)	1	ND	1
		Silicon (Si)	7440-21-3	mg/L	0.044	0.147	13.6	1	8.87	1	14.5	1	10.3	1	9.35	1	13.7	1
		Sulfur (S)	7704-34-9	mg/L	0.092	0.307	85.5	1	68.2	1	122	1	204	1	52.2	1	82.3	1
		Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	0.108	1	ND	1	0.860	1	BQL(0.032)	1	ND	1	0.053	1
		Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

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Sample Results (1, 2)

Analysts:

Steve. Markham

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML5-7											
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1										
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	0.537	1										
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	BQL(0.016)	1										
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.182	1										
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.025	1										
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1										
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	16.0	1										
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1										
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1										
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1										
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1										
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	0.827	1										
Potassium (K)	7440-09-7	mg/L	0.055	0.184	1.82	1										
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	2.70	1										
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.088	1										
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.012	1										
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	298	10										
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1										
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1										
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.003)	1										
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	0.011	1										
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.105	1										
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.013	1										
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.007)	1										
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	BQL(0.006)	1										
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	BQL(0.011)	1										
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	9.77	1										
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	197	1										
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	0.064	1										
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1										

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts:Steve. Markham

Method:RSKSOP 213(2)

Field Sample ID		ML6-3		ML6-3		ML6-5		ML6-7		ML7-3		ML7-5				
Sample Lab ID		3448-01		3448-01 Lab Dup.		3448-02		3448-03		3448-04		3448-05				
Date Collected		6/28/06		6/28/06		6/28/06		6/28/06		6/29/06		6/29/06				
Date Analyzed		7/10/06		7/10/06		7/10/06		7/10/06		7/10/06		7/10/06				
Analytes		Unit	MDL	QL	Data		DF	Data		DF	Data		DF	Data		DF
Names	Codes				Data	DF		Data	DF		Data	DF				
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	BQL(0.005)	1		ND (RPD=NA)	1		BQL(0.004)	1		ND	1	
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1		ND (RPD=NA)	1		ND	1		BQL(0.061)	1	
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.291	1		0.292 (RPD=0.34)	1		0.306	1		0.018	1	
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.157	1		0.157 (RPD=0.00)	1		0.143	1		0.174	1	
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.099	1		0.099 (RPD=0.00)	1		0.100	1		0.033	1	
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1		ND (RPD=NA)	1		ND	1		BQL(0.002)	1	
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	46.6	1		46.7 (RPD=0.22)	1		43.3	1		19.6	1	
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1		ND (RPD=NA)	1		ND	1		BQL(0.001)	1	
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1		ND (RPD=NA)	1		ND	1		BQL(0.001)	1	
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1		ND (RPD=NA)	1		ND	1		BQL(0.001)	1	
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1		ND (RPD=NA)	1		ND	1		ND	1	
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	45.1	1		45.1 (RPD=0.00)	1		54.7	1		1.26	1	
Potassium (K)	7440-09-7	mg/L	0.055	0.184	2.41	1		2.06 (RPD=15.66)	1		1.53	1		1.85	1	
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	23.7	1		23.6 (RPD=0.42)	1		24.5	1		3.07	1	
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.238	1		0.240 (RPD=0.84)	1		0.194	1		0.113	1	
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.010	1		0.010 (RPD=0.00)	1		0.009	1		0.015	1	
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	164	1		163 (RPD=0.61)	1		112	1		354	1	
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1		ND (RPD=NA)	1		ND	1		ND	1	
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1		ND (RPD=NA)	1		ND	1		BQL(0.003)	1	
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.009)	1		BQL(0.008) (RPD=NA)	1		BQL(0.006)	1		BQL(0.009)	1	
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	0.025	1		0.028 (RPD=11.32)	1		0.028	1		0.013	1	
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.321	1		0.322 (RPD=0.31)	1		0.305	1		0.136	1	
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1		ND (RPD=NA)	1		ND	1		BQL(0.004)	1	
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.013)	1		BQL(0.013) (RPD=NA)	1		BQL(0.013)	1		BQL(0.008)	1	
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	ND	1		ND (RPD=NA)	1		ND	1		0.013	1	
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	BQL(0.012)	1		BQL(0.009) (RPD=NA)	1		BQL(0.009)	1		BQL(0.010)	1	
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	9.55	1		9.55 (RPD=0.00)	1		10.1	1		8.35	1	
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	71.5	1		71.4 (RPD=0.14)	1		41.6	1		215	1	
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	0.124	1		0.125 (RPD=0.80)	1		0.189	1		0.072	1	
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1		ND (RPD=NA)	1		ND	1		ND	1	

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

- Notes:
- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
 - "-" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

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Technical Directive:

3ME344HW

Sample Results (1, 2)

Analysts:

Steve. Markham

Method:

RSKSOP 213(2)

Analytes		Unit	MDL	QL	Data		DF		Data		DF		Data		DF		Data		DF	
Names	Codes				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF		
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	BQL(0.047)	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	BQL(0.009)	1	0.026	1	BQL(0.015)	1	0.046	1	0.025	1	0.025 (RPD=0.00)	1	0.025 (RPD=0.00)	1	0.025 (RPD=0.00)	1
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.148	1	0.138	1	0.115	1	0.119	1	0.138	1	0.138 (RPD=0.00)	1	0.138 (RPD=0.00)	1	0.138 (RPD=0.00)	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.022	1	0.090	1	0.068	1	0.076	1	0.155	1	0.156 (RPD=0.64)	1	0.156 (RPD=0.64)	1	0.156 (RPD=0.64)	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	19.9	1	58.5	1	30.8	1	33.6	1	52.6	1	52.5 (RPD=0.19)	1	52.5 (RPD=0.19)	1	52.5 (RPD=0.19)	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	BQL(0.001)	1	BQL(0.002)	1	ND	1	BQL(0.001)	1	BQL(0.002) (RPD=NA)	1	BQL(0.002) (RPD=NA)	1	BQL(0.002) (RPD=NA)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	0.774	1	15.4	1	1.18	1	12.1	1	12.8	1	12.8 (RPD=0.00)	1	12.8 (RPD=0.00)	1	12.8 (RPD=0.00)	1
Potassium (K)	7440-09-7	mg/L	0.055	0.184	2.27	1	5.77	1	2.96	1	3.21	1	3.61	1	3.59 (RPD=0.56)	1	3.59 (RPD=0.56)	1	3.59 (RPD=0.56)	1
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	2.99	1	15.7	1	9.79	1	12.9	1	13.1	1	13.1 (RPD=0.00)	1	13.1 (RPD=0.00)	1	13.1 (RPD=0.00)	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.099	1	0.420	1	0.286	1	0.318	1	0.441	1	0.439 (RPD=0.45)	1	0.439 (RPD=0.45)	1	0.439 (RPD=0.45)	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.009	1	0.006	1	BQL(0.002)	1	BQL(0.003)	1	BQL(0.004)	1	0.004 (RPD=NA)	1	0.004 (RPD=NA)	1	0.004 (RPD=NA)	1
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	292	1	95.4	1	63.8	1	75.9	1	187	1	184 (RPD=1.62)	1	184 (RPD=1.62)	1	184 (RPD=1.62)	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	BQL(0.005)	1	BQL(0.005) (RPD=NA)	1	BQL(0.005) (RPD=NA)	1	BQL(0.005) (RPD=NA)	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.003)	1	BQL(0.005)	1	BQL(0.005)	1	BQL(0.004)	1	BQL(0.009)	1	BQL(0.008) (RPD=NA)	1	BQL(0.008) (RPD=NA)	1	BQL(0.008) (RPD=NA)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	BQL(0.010)	1	0.023	1	BQL(0.010)	1	0.014	1	0.022	1	0.021 (RPD=4.65)	1	0.021 (RPD=4.65)	1	0.021 (RPD=4.65)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.163	1	0.360	1	0.186	1	0.188	1	0.293	1	0.294 (RPD=0.34)	1	0.294 (RPD=0.34)	1	0.294 (RPD=0.34)	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.007)	1	BQL(0.012)	1	BQL(0.009)	1	BQL(0.009)	1	BQL(0.011)	1	BQL(0.013) (RPD=NA)	1	BQL(0.013) (RPD=NA)	1	BQL(0.013) (RPD=NA)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	BQL(0.005)	1	BQL(0.002)	1	ND	1	ND	1	ND	1	BQL(0.002) (RPD=NA)	1	BQL(0.002) (RPD=NA)	1	BQL(0.002) (RPD=NA)	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	BQL(0.007)	1	BQL(0.007)	1	BQL(0.009)	1	BQL(0.009)	1	BQL(0.011)	1	BQL(0.012) (RPD=NA)	1	BQL(0.012) (RPD=NA)	1	BQL(0.012) (RPD=NA)	1
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	8.04	1	8.85	1	7.92	1	9.82	1	8.10	1	8.12 (RPD=0.25)	1	8.12 (RPD=0.25)	1	8.12 (RPD=0.25)	1
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	170	1	22.2	1	22.4	1	9.44	1	122	1	124 (RPD=1.63)	1	124 (RPD=1.63)	1	124 (RPD=1.63)	1
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	BQL(0.030)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
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Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

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Technical Directive:

3ME344HW

Sample Results (1, 2)

Analysts:

Steve. Markham

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML2-2											
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1										
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1										
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.041	1										
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.137	1										
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.079	1										
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1										
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	62.6	1										
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1										
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	BQL(0.001)	1										
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1										
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1										
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	1.53	1										
Potassium (K)	7440-09-7	mg/L	0.055	0.184	4.17	1										
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	13.1	1										
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.396	1										
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.008	1										
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	66.0	1										
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1										
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1										
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.006)	1										
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	0.021	1										
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.344	1										
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1										
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.011)	1										
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	ND	1										
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	BQL(0.008)	1										
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	9.30	1										
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	17.9	1										
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	ND	1										
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1										

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
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Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

Metals

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Technical Directive:

3ME345HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		FIELD BLANK		PMW-1		PMW-2		PMW-6		PMW-3		PMW-4	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	ND	1	135	1	0.684	1	BQL(0.100)	1	0.204	1	0.362	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	ND	1	0.045	1	0.029	1	0.036	1	0.077	1	0.022	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	ND	1	0.122	1	0.149	1	0.141	1	0.170	1	0.140	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	ND	1	0.399	1	0.041	1	0.064	1	0.067	1	0.070	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	BQL(0.003)	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	BQL(0.032)	1	61.0	1	34.3	1	24.4	1	22.8	1	18.7	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	0.019	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	0.146	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	BQL(0.013)	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	ND	1	71.6	1	6.02	1	13.5	1	27.3	1	8.94	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	ND	1	8.21	1	1.01	1	1.04	1	1.10	1	1.21	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	ND	1	14.7	1	9.45	1	10.4	1	13.1	1	7.39	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	ND	1	0.425	1	0.096	1	0.100	1	0.084	1	0.096	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	0.009	1	BQL(0.003)	1	BQL(0.003)	1	BQL(0.003)	1	BQL(0.002)	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	BQL(0.061)	1	17.4	1	46.0	1	42.7	1	45.6	1	48.3	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	0.040	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1	0.045	1	ND	1	ND	1	ND	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	ND	1	ND	1	BQL(0.006)	1	BQL(0.005)	1	BQL(0.008)	1	BQL(0.005)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	ND	1	0.013	1	BQL(0.008)	1	BQL(0.009)	1	0.013	1	BQL(0.008)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	ND	1	0.344	1	0.161	1	0.135	1	0.144	1	0.106	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	1.79	1	0.009	1	BQL(0.002)	1	BQL(0.004)	1	0.007	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	ND	1	0.021	1	BQL(0.010)	1	BQL(0.006)	1	BQL(0.008)	1	ND	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1	0.178	1	ND	1	ND	1	BQL(0.002)	1	BQL(0.003)	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	0.173	1	BQL(0.013)	1	0.047	1	BQL(0.016)	1	BQL(0.013)	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	BQL(0.153)	1	201	1	16.1	1	15.1	1	14.6	1	14.2	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND	1	15.7	1	14.2	1	13.2	1	10.0	1	13.8	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	ND	1	0.994	1	0.782	1	0.705	1	0.787	1	0.478	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

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Technical Directive:

3ME345HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		PMW-5		ML1-3		ML1-3		ML1-3		ML1-5		ML1-7	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	0.235	1	560	1	594 (RPD=5.89)	1	555 (RPD=0.90)	1	16.3	1	0.350	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.040	1	0.148	1	0.154 (RPD=3.97)	1	0.149 (RPD=0.67)	1	BQL(0.017)	1	ND	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.142	1	0.326	1	0.346 (RPD=5.95)	1	0.344 (RPD=5.37)	1	0.151	1	0.111	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.052	1	1.21	1	1.25 (RPD=3.25)	1	1.20 (RPD=0.83)	1	0.124	1	0.065	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	0.023	1	0.024 (RPD=4.26)	1	0.023 (RPD=0.00)	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	23.9	1	61.2	1	61.8 (RPD=0.98)	1	61.1 (RPD=0.16)	1	34.3	1	23.8	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	BQL(0.003)	1	0.154	1	0.160 (RPD=3.82)	1	0.155 (RPD=0.65)	1	BQL(0.004)	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	BQL(0.002)	1	0.710	1	0.731 (RPD=2.91)	1	0.712 (RPD=0.28)	1	0.020	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	0.114	1	0.119 (RPD=4.29)	1	0.113 (RPD=0.88)	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	6.81	1	305	1	313 (RPD=2.59)	1	302 (RPD=0.99)	1	9.98	1	0.938	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.76	1	30.3	1	31.9 (RPD=5.14)	1	30.1 (RPD=0.66)	1	4.02	1	2.84	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	8.46	1	47.1	1	47.8 (RPD=1.48)	1	46.5 (RPD=1.28)	1	7.88	1	3.20	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.127	1	1.75	1	1.81 (RPD=3.37)	1	1.76 (RPD=0.57)	1	0.246	1	0.144	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.005	1	0.030	1	0.029 (RPD=3.39)	1	0.030 (RPD=0.00)	1	0.009	1	0.007	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	46.2	1	61.8	1	62.3 (RPD=0.81)	1	61.6 (RPD=0.32)	1	281	1	230	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	BQL(0.007)	1	0.272	1	0.285 (RPD=4.67)	1	0.273 (RPD=0.37)	1	BQL(0.008)	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1	0.178	1	0.181 (RPD=1.67)	1	0.177 (RPD=0.56)	1	BQL(0.004)	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.008)	1	ND	1	ND (RPD=NA)	1	ND (RPD=NA)	1	BQL(0.008)	1	BQL(0.008)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.010)	1	0.024	1	0.023 (RPD=4.26)	1	0.021 (RPD=13.33)	1	0.013	1	BQL(0.009)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.129	1	0.783	1	0.790 (RPD=0.89)	1	0.774 (RPD=1.16)	1	0.248	1	0.114	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.007	1	6.83	1	7.01 (RPD=2.60)	1	6.78 (RPD=0.73)	1	0.416	1	0.009	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	ND	1	0.047	1	0.050 (RPD=6.19)	1	0.050 (RPD=6.19)	1	BQL(0.009)	1	BQL(0.010)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.003)	1	0.866	1	0.883 (RPD=1.94)	1	0.851 (RPD=1.75)	1	0.027	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	BQL(0.017)	1	0.814	1	0.834 (RPD=2.43)	1	0.838 (RPD=2.91)	1	0.044	1	BQL(0.018)	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	15.7	1	257	1	258 (RPD=0.39)	1	258 (RPD=0.39)	1	34.2	1	7.97	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	11.0	1	150	1	155 (RPD=3.28)	1	150 (RPD=0.00)	1	170	1	139	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.492	1	7.13	1	7.23 (RPD=1.39)	1	7.13 (RPD=0.00)	1	0.196	1	BQL(0.032)	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. * -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

Report Date:

7/24/06

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Technical Directive:

3ME345HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML1-7		ML2-3		ML2-5		ML2-7		ML3-3		ML3-3	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	0.372 (RPD=6.09)	1	7.36	1	16.3	1	0.616	1	1.69	1	1.68 (RPD=0.59)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	ND (RPD=NA)	1	0.055	1	0.025	1	BQL(0.015)	1	0.109	1	0.107 (RPD=1.85)	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.109 (RPD=1.82)	1	0.181	1	0.208	1	0.200	1	0.159	1	0.159 (RPD=0.00)	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.066 (RPD=1.53)	1	0.074	1	0.068	1	0.018	1	0.072	1	0.072 (RPD=0.00)	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	BQL(0.001)	1	ND	1	ND	1	ND (RPD=NA)	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	24.0 (RPD=0.84)	1	42.0	1	20.1	1	17.2	1	45.0	1	45.0 (RPD=0.00)	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND (RPD=NA)	1	BQL(0.001)	1	0.005	1	ND	1	ND	1	ND (RPD=NA)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND (RPD=NA)	1	0.007	1	0.026	1	ND	1	BQL(0.002)	1	BQL(0.002) (RPD=NA)	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	0.951 (RPD=1.38)	1	4.42	1	10.5	1	0.509	1	8.21	1	8.24 (RPD=0.36)	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	2.84 (RPD=0.00)	1	3.44	1	2.23	1	2.20	1	3.19	1	3.18 (RPD=0.31)	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	3.24 (RPD=1.24)	1	8.91	1	5.70	1	2.29	1	11.3	1	11.3 (RPD=0.00)	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.142 (RPD=1.40)	1	0.256	1	0.104	1	0.061	1	0.353	1	0.354 (RPD=0.28)	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.007 (RPD=0.00)	1	0.018	1	0.012	1	0.015	1	0.012	1	0.012 (RPD=0.00)	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	234 (RPD=1.72)	1	228	1	192	1	300	1	225	1	224 (RPD=0.45)	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND (RPD=NA)	1	BQL(0.004)	1	BQL(0.009)	1	ND	1	ND	1	ND (RPD=NA)	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND (RPD=NA)	1	BQL(0.003)	1	BQL(0.004)	1	ND	1	ND	1	ND (RPD=NA)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.007) (RPD=NA)	1	BQL(0.008)	1	BQL(0.004)	1	BQL(0.006)	1	BQL(0.007)	1	BQL(0.007) (RPD=NA)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.009) (RPD=NA)	1	0.011	1	BQL(0.010)	1	BQL(0.010)	1	0.011	1	BQL(0.010) (RPD=NA)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.114 (RPD=0.00)	1	0.282	1	0.163	1	0.177	1	0.274	1	0.274 (RPD=0.00)	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.009 (RPD=0.00)	1	0.178	1	0.406	1	0.010	1	0.040	1	0.039 (RPD=2.53)	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.009) (RPD=NA)	1	BQL(0.011)	1	BQL(0.007)	1	BQL(0.006)	1	BQL(0.012)	1	BQL(0.009) (RPD=NA)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND (RPD=NA)	1	0.015	1	0.028	1	0.022	1	ND	1	BQL(0.004) (RPD=NA)	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	BQL(0.018) (RPD=NA)	1	0.027	1	0.037	1	BQL(0.009)	1	BQL(0.022)	1	BQL(0.017) (RPD=NA)	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	7.96 (RPD=0.13)	1	20.6	1	44.9	1	11.6	1	11.9	1	11.9 (RPD=0.00)	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	138 (RPD=0.72)	1	104	1	83.2	1	142	1	97.9	1	97.1 (RPD=0.82)	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	BQL(0.030) (RPD=NA)	1	0.098	1	1.63	1	0.056	1	0.045	1	0.049 (RPD=8.51)	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:MetalsReport Date:7/24/06

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Technical Directive:3ME345HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 213(2)

Field Sample ID		ML3-5		ML3-7		ML3-7 DUPLICATE		ML4-3		ML4-5		ML4-7				
Sample Lab ID		3447-15		3447-16		3447-17		3447-18		3447-19		3447-20				
Date Collected		6/27/06		6/27/06		6/27/06		6/28/06		6/28/06		6/28/06				
Date Analyzed		7/13/06		7/13/06		7/13/06		7/13/06		7/13/06		7/13/06				
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	13.4	1	1.98	1	1.75	1	0.513	1	8.00	1	0.230	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.025	1	BQL(0.007)	1	BQL(0.006)	1	0.103	1	0.019	1	BQL(0.006)	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.191	1	0.143	1	0.144	1	0.151	1	0.187	1	0.162	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.063	1	0.042	1	0.041	1	0.073	1	0.058	1	0.054	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	16.7	1	21.2	1	20.7	1	40.1	1	33.6	1	51.7	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	BQL(0.004)	1	ND	1	ND	1	ND	1	BQL(0.001)	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	0.019	1	BQL(0.002)	1	BQL(0.002)	1	BQL(0.001)	1	0.010	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	7.89	1	2.77	1	2.56	1	29.0	1	8.58	1	0.906	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	2.01	1	2.76	1	2.74	1	1.44	1	2.15	1	2.23	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	3.82	1	3.71	1	3.62	1	21.5	1	10.4	1	18.2	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.110	1	0.135	1	0.132	1	0.259	1	0.152	1	0.133	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.007	1	0.005	1	0.005	1	0.008	1	0.008	1	0.012	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	167	1	201	1	205	1	152	1	231	1	328	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	BQL(0.006)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	BQL(0.004)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.007)	1	BQL(0.005)	1	BQL(0.007)	1	BQL(0.008)	1	BQL(0.005)	1	BQL(0.008)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.007)	1	BQL(0.007)	1	BQL(0.007)	1	BQL(0.009)	1	BQL(0.011)	1	BQL(0.010)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.139	1	0.115	1	0.113	1	0.275	1	0.217	1	0.250	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.339	1	0.043	1	0.035	1	0.012	1	0.225	1	0.005	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.007)	1	BQL(0.007)	1	BQL(0.007)	1	BQL(0.012)	1	BQL(0.011)	1	BQL(0.010)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	0.023	1	BQL(0.003)	1	BQL(0.002)	1	ND	1	0.014	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	0.033	1	BQL(0.013)	1	BQL(0.013)	1	BQL(0.021)	1	0.025	1	BQL(0.020)	1
Sillicon (Si)	7440-21-3	mg/L	0.049	0.163	39.8	1	17.2	1	16.7	1	9.44	1	27.4	1	10.9	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	69.6	1	85.4	1	87.8	1	62.2	1	114	1	176	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	1.19	1	0.114	1	0.105	1	ND	1	0.868	1	BQL(0.033)	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

- Notes:
- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
 - " -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory: Metals Report Date: 7/24/06

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Technical Directive: 3ME345HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 213(2)

Analytes		Unit	Field Sample ID				ML5-3				ML5-5				ML5-7			
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1				
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	0.286	1	0.298 (RPD=4.11)	1	7.17	1	12.8	1	12.8 (RPD=0.00)	1				
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.212	1	0.218 (RPD=2.79)	1	BQL(0.012)	1	BQL(0.010)	1	BQL(0.013) (RPD=NA)	1				
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.145	1	0.145 (RPD=0.00)	1	0.184	1	0.195	1	0.194 (RPD=0.51)	1				
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.093	1	0.095 (RPD=2.13)	1	0.051	1	0.051	1	0.051 (RPD=0.00)	1				
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1				
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	45.5	1	46.3 (RPD=1.74)	1	21.8	1	20.4	1	20.4 (RPD=0.00)	1				
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1				
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1				
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	0.008	1	0.012	1	0.012 (RPD=0.00)	1				
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1				
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	41.6	1	42.2 (RPD=1.43)	1	4.75	1	5.17	1	5.16 (RPD=0.19)	1				
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.46	1	1.45 (RPD=0.69)	1	2.36	1	2.66	1	2.32 (RPD=13.65)	1				
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	23.7	1	23.8 (RPD=0.42)	1	5.62	1	4.32	1	4.30 (RPD=0.46)	1				
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.293	1	0.294 (RPD=0.34)	1	0.180	1	0.123	1	0.122 (RPD=0.82)	1				
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.009	1	0.009 (RPD=0.00)	1	0.006	1	0.016	1	0.015 (RPD=6.45)	1				
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	122	1	121 (RPD=0.82)	1	178	1	345	10	351 (RPD=1.72)	10				
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1				
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1	ND (RPD=NA)	1	ND	1	ND	1	BQL(0.004) (RPD=NA)	1				
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.007)	1	BQL(0.007) (RPD=NA)	1	BQL(0.007)	1	BQL(0.006)	1	BQL(0.006) (RPD=NA)	1				
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	0.013	1	0.012 (RPD=8.00)	1	BQL(0.008)	1	BQL(0.009)	1	BQL(0.007) (RPD=NA)	1				
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.311	1	0.317 (RPD=1.91)	1	0.157	1	0.146	1	0.146 (RPD=0.00)	1				
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.008	1	0.008 (RPD=0.00)	1	0.207	1	0.265	1	0.265 (RPD=0.00)	1				
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.015)	1	BQL(0.016) (RPD=NA)	1	BQL(0.009)	1	BQL(0.007)	1	BQL(0.008) (RPD=NA)	1				
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1	ND (RPD=NA)	1	0.013	1	0.021	1	0.020 (RPD=4.88)	1				
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	BQL(0.019)	1	0.023 (RPD=NA)	1	BQL(0.016)	1	BQL(0.020)	1	BQL(0.020) (RPD=NA)	1				
Sillicon (Si)	7440-21-3	mg/L	0.049	0.163	9.59	1	9.62 (RPD=0.31)	1	24.5	1	32.3	1	32.3 (RPD=0.00)	1				
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	49.7	1	49.0 (RPD=1.42)	1	83.6	1	216	1	214 (RPD=0.93)	1				
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	ND	1	ND (RPD=NA)	1	0.102	1	0.181	1	0.182 (RPD=0.55)	1				
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1				

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

- Notes:
- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
 - " -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **7/26/06**

Technical Directive: **3ME345HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID		FIELD BLANK		PMW-1		PMW-2		PMW-6		PMW-6		PMW-3	
Sample Lab ID		3447-01		3447-02		3447-03		3447-04		3447-04 Lab Dup.		3447-05	
Date Collected		6/26/06		6/26/06		6/26/06		6/26/06		6/26/06		6/26/06	
Date Analyzed		7/17, 7/18, 7/19 & 7/24/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06	
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.027	0.089	ND	1	36.2	1	22.6	1	28.5	1	28.6 (RPD=0.35)	1	65.1	1
0.094	0.352	BQL(0.200)	1	156	1	1.31	1	1.01	1	1.01 (RPD=0.00)	1	1.49	1
0.034	0.115	1.20	1	23.8	1	1.36	1	1.89	1	1.89 (RPD=0.00)	1	1.99	1
0.251	0.836	2.89	1	—	—	—	—	—	—	—	—	—	—
0.020	0.067	0.343	1	52.5	1	0.578	1	0.657	1	0.641 (RPD=2.47)	1	0.705	1
0.203	0.677	ND	1	5.04	1	8.16	1	9.01	1	9.48 (RPD=5.08)	1	9.73	1
0.002	0.008	ND	1	21.2	1	0.196	1	0.111	1	0.110 (RPD=0.90)	1	0.150	1
0.123	0.411	ND	1	—	—	5.80	1	14.6	1	14.7 (RPD=0.68)	1	6.91	1
0.033	0.111	ND	1	BQL(0.110)	1	ND	1	ND	1	ND (RPD=NA)	1	BQL(0.048)	1

Comments:
 No problems noted. All QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **7/26/06**

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Technical Directive: **3ME345HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	PMW-4	PMW-5	PMW-5	ML1-3	ML1-3	ML1-5
Sample Lab ID	3447-06	3447-07	3447-07 Lab Dup.*	3447-08	3447-08 Lab Dup.*	3447-09
Date Collected	6/26/06	6/27/06	6/27/06	6/27/06	6/27/06	6/27/06
Date Analyzed	7/17, 7/18 & 7/19/06	7/17, 7/18 & 7/19/06	7/18/06	7/17 & 7/19/06	7/17 & 7/19/06	7/17, 7/18 & 7/19/06

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	17.9	1	31.3	1	31.4 (RPD=0.32)	1	103	1	107 (RPD=3.81)	1	10.1	1
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	1.51	1	1.30	1	1.25 (RPD=3.92)	1	—	—	—	—	23.1	1
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	1.37	1	2.06	1	1.58 (RPD=26.37)	1	122	1	126 (RPD=3.23)	1	5.73	1
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	0.868	1	0.704	1	—	—	229	1	234 (RPD=2.16)	1	5.58	1
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	9.28	1	8.96	1	8.95 (RPD=0.11)	1	12.4	1	12.2 (RPD=1.63)	1	7.45	1
Uranium (U)	7440-61-1	µg/L	0.002	0.008	0.123	1	0.249	1	0.251 (RPD=0.80)	1	104	1	106 (RPD=1.90)	1	5.38	1
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	7.23	1	7.66	1	6.43 (RPD=17.46)	1	—	—	—	—	25.9	1
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	1	ND	1	—	—	0.396	1	0.389 (RPD=1.78)	1	BQL(0.059)	1

Comments:
 No problems noted. All QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

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Technical Directive:

3ME345HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 257(1)

Analysts:	S. Markham/S. Saye		Field Sample ID			ML1-5		ML1-7		ML2-3		ML2-5		ML2-7		ML3-3	
	Method:	RKSOP 257(1)	Sample Lab ID			3447-09 Lab Dup.		3447-010		3447-11		3447-12		3447-13		3447-14	
			Date Collected			6/27/06		6/27/06		6/27/06		6/27/06		6/27/06		6/27/06	
			Date Analyzed			7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																
Arsenic (As)		7440-38-2	µg/L	0.027	0.089	10.2 (RPD=0.99)	1	2.28	1	43.6	1	18.4	1	10.8	1	89.6	1
Chromium (Cr)		7440-47-3	µg/L	0.094	0.352	23.2 (RPD=0.43)	1	1.36	1	9.77	1	29.2	1	1.34	1	3.44	1
Copper (Cu)		7440-50-8	µg/L	0.034	0.115	5.78 (RPD=0.87)	1	1.88	1	3.49	1	5.84	1	2.24	1	2.80	1
Iron (Fe)		7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)		7439-92-1	µg/L	0.020	0.067	5.57 (RPD=0.18)	1	0.483	1	3.02	1	6.81	1	0.378	1	1.54	1
Selenium (Se)		7782-49-2	µg/L	0.203	0.677	7.66 (RPD=2.78)	1	5.92	1	10.8	1	7.58	1	9.57	1	8.95	1
Uranium (U)		7440-61-1	µg/L	0.002	0.008	5.40 (RPD=0.37)	1	0.098	1	14.8	1	14.5	1	9.81	1	5.73	1
Zinc (Zn)		7440-62-2	µg/L	0.123	0.411	25.9 (RPD=0.00)	1	9.20	1	12.0	1	24.3	1	5.11	1	9.24	1
Mercury (Hg)		7439-97-6	µg/L	0.033	0.111	BQL(0.042) (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:
No problems noted. All QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **7/26/06**

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Technical Directive: **3ME345HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID			ML3-3		ML3-5		ML3-7		ML3-7 DUPLICATE		ML4-3		ML4-3	
Sample Lab ID			3447-14 Lab Dup.*		3447-15		3447-16		3447-17		3447-18		3447-18 Lab Dup.	
Date Collected			6/27/06		6/27/06		6/27/06		6/27/06		6/28/06		6/28/06	
Date Analyzed			7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06	
	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
	0.027	0.089	88.6 (RPD=1.12)	1	18.1	1	5.50	1	5.24	1	81.3	1	83.9 (RPD=3.15)	1
	0.094	0.352	3.29 (RPD=4.46)	1	21.8	1	3.07	1	2.71	1	1.82	1	1.84 (RPD=1.09)	1
	0.034	0.115	2.44 (RPD=13.74)	1	3.89	1	2.02	1	1.86	1	3.79	1	3.89 (RPD=2.60)	1
	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
	0.020	0.067	1.41 (RPD=8.81)	1	4.37	1	0.711	1	0.668	1	0.812	1	0.804 (RPD=0.99)	1
	0.203	0.677	8.74 (RPD=2.37)	1	9.66	1	6.77	1	6.56	1	13.0	1	13.8 (RPD=5.97)	1
	0.002	0.008	5.69 (RPD=0.70)	1	5.88	1	1.68	1	1.85	1	6.23	1	6.28 (RPD=0.80)	1
	0.123	0.411	6.99 (RPD=27.73)	1	20.6	1	6.79	1	5.76	1	9.34	1	9.22 (RPD=1.29)	1
	0.033	0.111	BQL(0.039) (RPD=NA)	1	ND	1	BQL(0.038)	1	ND	1	ND	1	ND (RPD=NA)	1

Comments:
 No problems noted. All QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 7/26/06

Technical Directive: 3ME345HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 257(1)

Analysts:	S. Markham/S. Saye		Field Sample ID			ML4-3		ML4-5		ML4-7		ML5-3		ML5-5		ML5-7	
	Method:	RKSOP 257(1)	Sample Lab ID			3447-18 Lab Dup.*		3447-19		3447-20		3447-21		3447-22		3447-23	
			Date Collected			6/28/06		6/28/06		6/28/06		6/28/06		6/28/06		6/28/06	
			Date Analyzed			7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06		7/17, 7/18 & 7/19/06	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																
Arsenic (As)		7440-38-2	µg/L	0.027	0.089	82.1 (RPD=0.98)	1	14.2	1	3.63	1	175	1	9.30	1	7.49	1
Chromium (Cr)		7440-47-3	µg/L	0.094	0.352	1.94 (RPD=6.38)	1	12.0	1	1.10	1	1.78	1	9.62	1	15.2	1
Copper (Cu)		7440-50-8	µg/L	0.034	0.115	3.79 (RPD=0.00)	1	4.10	1	3.28	1	3.04	1	3.84	1	5.06	1
Iron (Fe)		7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)		7439-92-1	µg/L	0.020	0.067	0.760 (RPD=6.62)	1	2.50	1	0.299	1	0.401	1	2.36	1	3.44	1
Selenium (Se)		7782-49-2	µg/L	0.203	0.677	12.3 (RPD=5.53)	1	10.7	1	8.01	1	10.3	1	11.0	1	8.18	1
Uranium (U)		7440-61-1	µg/L	0.002	0.008	6.27 (RPD=0.64)	1	16.1	1	43.3	1	1.70	1	3.31	1	2.80	1
Zinc (Zn)		7440-62-2	µg/L	0.123	0.411	11.2 (RPD=18.11)	1	13.0	1	6.10	1	7.99	1	10.4	1	11.8	1
Mercury (Hg)		7439-97-6	µg/L	0.033	0.111	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	BQL(0.047)	1

Comments:
No problems noted. All QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

Report Date:

7/25/06

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Technical Directive:

3ME345HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	MDL	QL	Field Sample ID		ML6-3		ML6-3		ML6-5		ML6-5		ML6-7		ML7-3	
Names	Codes				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	0.310	1	0.409 (RPD=27.54)	1	0.378	1	0.365 (RPD=3.50)	1	1.61	1	20.2	1		
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.145	1	0.150 (RPD=3.39)	1	0.100	1	0.097 (RPD=3.05)	1	BQL(0.009)	1	0.212	1		
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.155	1	0.157 (RPD=1.28)	1	0.142	1	0.141 (RPD=0.71)	1	0.179	1	0.213	1		
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.094	1	0.095 (RPD=1.06)	1	0.093	1	0.092 (RPD=1.08)	1	0.039	1	0.196	1		
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.001)	1		
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	47.4	1	47.6 (RPD=0.42)	1	44.2	1	44.0 (RPD=0.45)	1	21.2	1	53.6	1		
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1		
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.002)	1		
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	0.020	1		
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1		
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	26.1	1	26.6 (RPD=1.90)	1	26.9	1	26.9 (RPD=0.00)	1	1.46	1	58.2	1		
Potassium (K)	7440-09-7	mg/L	0.061	0.204	2.06	1	2.09 (RPD=1.45)	1	1.54	1	1.50 (RPD=2.63)	1	2.44	1	3.37	1		
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	23.6	1	23.6 (RPD=0.00)	1	24.8	1	24.8 (RPD=0.00)	1	3.44	1	24.0	1		
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.256	1	0.258 (RPD=0.78)	1	0.201	1	0.200 (RPD=0.50)	1	0.122	1	0.318	1		
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.008	1	0.008 (RPD=0.00)	1	0.005	1	0.005 (RPD=0.00)	1	0.015	1	0.017	1		
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	169	1	171 (RPD=1.18)	1	114	1	113 (RPD=0.88)	1	357	10	335	1		
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.007)	1		
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.007)	1		
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.008)	1	BQL(0.010) (RPD=NA)	1	BQL(0.008)	1	BQL(0.007) (RPD=NA)	1	BQL(0.006)	1	BQL(0.010)	1		
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.011)	1	BQL(0.010) (RPD=NA)	1	BQL(0.010)	1	BQL(0.011) (RPD=NA)	1	BQL(0.008)	1	0.016	1		
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.324	1	0.325 (RPD=0.31)	1	0.311	1	0.309 (RPD=0.65)	1	0.147	1	0.450	1		
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.008	1	0.011 (RPD=31.58)	1	0.009	1	0.009 (RPD=0.00)	1	0.026	1	0.444	1		
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.010)	1	BQL(0.012) (RPD=NA)	1	BQL(0.009)	1	BQL(0.008) (RPD=NA)	1	ND	1	BQL(0.016)	1		
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1	BQL(0.003) (RPD=NA)	1	BQL(0.005)	1	BQL(0.006) (RPD=NA)	1	0.012	1	0.035	1		
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	BQL(0.020)	1	0.024 (RPD=NA)	1	BQL(0.016)	1	BQL(0.017) (RPD=NA)	1	BQL(0.017)	1	0.044	1		
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	9.24	1	9.42 (RPD=1.93)	1	9.75	1	9.76 (RPD=0.10)	1	11.8	1	37.9	1		
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	71.7	1	72.3 (RPD=0.83)	1	39.1	1	39.0 (RPD=0.26)	1	222	1	165	1		
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.062	1	0.064 (RPD=3.17)	1	0.044	1	0.045 (RPD=2.25)	1	0.077	1	0.067	1		
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1		

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
- " -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

Metals

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Technical Directive:

3ME345HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	MDL		Data		DF		Data		DF		Data		DF		Data		DF	
Names	Codes																			
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1			ND	1			ND	1			ND	1		
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	0.422	1			0.636	1			BQL(0.094)	1			BQL(0.130)	1		
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	BQL(0.013)	1			BQL(0.007)	1			BQL(0.011)	1			BQL(0.008)	1		
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.216	1			0.146	1			0.140	1			0.112	1		
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.028	1			0.024	1			0.090	1			0.069	1		
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1			ND	1			ND	1			ND	1		
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	22.0	1			21.0	1			59.0	1			31.0	1		
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1			ND	1			ND	1			ND	1		
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1			ND	1			ND	1			BQL(0.001)	1		
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1			ND	1			ND	1			ND	1		
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1			ND	1			ND	1			ND	1		
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	1.67	1			0.844	1			12.4	1			1.02	1		
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.70	1			2.32	1			5.87	1			2.94	1		
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	4.32	1			3.17	1			15.8	1			9.92	1		
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.122	1			0.104	1			0.435	1			0.294	1		
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.008	1			0.010	1			0.006	1			BQL(0.003)	1		
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	258	1			301	1			91.7	1			60.8	1		
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1			ND	1			ND	1			ND	1		
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1			ND	1			ND	1			ND	1		
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.007)	1			BQL(0.005)	1			BQL(0.010)	1			BQL(0.009)	1		
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.005)	1			BQL(0.007)	1			BQL(0.010)	1			BQL(0.007)	1		
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.177	1			0.175	1			0.363	1			0.188	1		
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.010	1			0.009	1			BQL(0.002)	1			BQL(0.004)	1		
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	ND	1			ND	1			BQL(0.011)	1			ND	1		
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.005)	1			0.008	1			BQL(0.005)	1			BQL(0.004)	1		
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	BQL(0.009)	1			BQL(0.014)	1			BQL(0.019)	1			BQL(0.014)	1		
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	17.2	1			9.58	1			8.60	1			7.76	1		
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	122	1			165	1			19.7	1			20.4	1		
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.698	1			BQL(0.033)	1			ND	1			ND	1		
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1			ND	1			ND	1			ND	1		

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. * -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:MetalsReport Date:7/25/06

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Technical Directive:3ME345HW

Sample Results (1, 2)

Analysts:	S. Markham/S. Saye		Field Sample ID		ML1-2		ML1-2		ML2-2								
			Sample Lab ID		3456-01 Lab Dup.		3456-01 Lab Dup.*		3456-02								
			Date Collected		6/29/06		6/29/06		6/29/06								
			Date Analyzed		7/17/06		7/17/06		7/17/06								
Method:	RSKSOP 213(2)		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Analytes																	
Names		Codes															
Silver (Ag)		7440-22-4	mg/L	0.003	0.011	ND (RPD=NA)	1	ND (RPD=NA)	1	ND	1						
Aluminum (Al)		7429-90-5	mg/L	0.040	0.133	0.495 (RPD=1.02)	1	0.565 (RPD=14.22)	1	3.99	1						
Arsenic (As)		7440-38-2	mg/L	0.006	0.019	BQL(0.015) (RPD=NA)	1	BQL(0.017) (RPD=NA)	1	0.025	1						
Boron (B)		7440-42-8	mg/L	0.014	0.049	0.134 (RPD=0.74)	1	0.134 (RPD=0.74)	1	0.136	1						
Barium (Ba)		7440-39-3	mg/L	0.001	0.004	0.154 (RPD=1.31)	1	0.155 (RPD=1.95)	1	0.097	1						
Beryllium (Be)		7440-41-7	mg/L	0.001	0.004	ND (RPD=NA)	1	ND (RPD=NA)	1	ND	1						
Calcium (Ca)		7440-70-2	mg/L	0.027	0.089	51.7 (RPD=1.17)	1	51.8 (RPD=1.36)	1	61.6	1						
Cadmium (Cd)		7440-43-9	mg/L	0.001	0.004	ND (RPD=NA)	1	ND (RPD=NA)	1	ND	1						
Cobalt (Co)		7440-48-4	mg/L	0.001	0.004	ND (RPD=NA)	1	BQL(0.001) (RPD=NA)	1	BQL(0.002)	1						
Chromium (Cr)		7440-47-3	mg/L	0.001	0.004	ND (RPD=NA)	1	ND (RPD=NA)	1	BQL(0.003)	1						
Copper (Cu)		7440-50-8	mg/L	0.006	0.019	ND (RPD=NA)	1	ND (RPD=NA)	1	ND	1						
Iron (Fe)		7439-89-6	mg/L	0.006	0.019	12.9 (RPD=0.77)	1	12.8 (RPD=1.55)	1	4.90	1						
Potassium (K)		7440-09-7	mg/L	0.061	0.204	3.66 (RPD=2.21)	1	3.69 (RPD=3.03)	1	4.90	1						
Magnesium (Mg)		7439-95-4	mg/L	0.027	0.089	12.9 (RPD=0.78)	1	12.9 (RPD=0.78)	1	13.1	1						
Manganese (Mn)		7439-96-5	mg/L	0.001	0.004	0.446 (RPD=0.45)	1	0.446 (RPD=0.45)	1	0.421	1						
Molybdenum (Mo)		7439-98-7	mg/L	0.001	0.004	BQL(0.004) (RPD=NA)	1	0.004 (RPD=NA)	1	0.008	1						
Sodium (Na)		7440-23-5	mg/L	0.047	0.155	169 (RPD=0.59)	1	170 (RPD=1.18)	1	65.8	1						
Nickel (Ni)		7440-02-0	mg/L	0.003	0.011	BQL(0.004) (RPD=NA)	1	BQL(0.004) (RPD=NA)	1	BQL(0.004)	1						
Lead (Pb)		7439-92-1	mg/L	0.002	0.008	ND (RPD=NA)	1	ND (RPD=NA)	1	ND	1						
Antimony (Sb)		7440-36-0	mg/L	0.003	0.011	BQL(0.008) (RPD=NA)	1	BQL(0.009) (RPD=NA)	1	BQL(0.010)	1						
Selenium (Se)		7782-49-2	mg/L	0.003	0.011	BQL(0.009) (RPD=NA)	1	BQL(0.005) (RPD=NA)	1	BQL(0.007)	1						
Strontium (Sr)		7440-24-6	mg/L	0.001	0.004	0.290 (RPD=1.04)	1	0.291 (RPD=1.38)	1	0.344	1						
Titanium (Ti)		7440-32-6	mg/L	0.001	0.004	0.021 (RPD=0.00)	1	0.030 (RPD=35.29)	1	0.130	1						
Thallium (Tl)		7440-28-0	mg/L	0.006	0.019	BQL(0.011) (RPD=NA)	1	BQL(0.012) (RPD=NA)	1	BQL(0.010)	1						
Vanadium (V)		7440-62-2	mg/L	0.002	0.008	BQL(0.003) (RPD=NA)	1	BQL(0.005) (RPD=NA)	1	0.008	1						
Zinc (Zn)		7440-66-6	mg/L	0.007	0.022	BQL(0.019) (RPD=NA)	1	0.025 (RPD=NA)	1	0.028	1						
Silicon (Si)		7440-21-3	mg/L	0.049	0.163	8.93 (RPD=0.11)	1	9.07 (RPD=1.67)	1	15.2	1						
Sulfur (S)		7704-34-9	mg/L	0.102	0.341	108 (RPD=0.00)	1	109 (RPD=0.92)	1	19.1	1						
Phosphorus (P)		7723-14-0	mg/L	0.012	0.041	ND (RPD=NA)	1	ND (RPD=NA)	1	BQL(0.023)	1						
Uranium (U)		7440-61-1	mg/L	0.008	0.027	ND (RPD=NA)	1	ND (RPD=NA)	1	ND	1						

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2). * = digested duplicate

- Notes:
- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
 - * - denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 7/25/06

Technical Directive: 3ME345HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 257(1)

Analysts:	S. Markham/S. Saye		Field Sample ID		ML6-3		ML6-3		ML6-3		ML6-5		ML6-7		ML7-3		
			Sample Lab ID		3449-01		3449-01 Lab Dup.		3449-01 Lab Dup.*		3449-02		3449-03		3449-04		
Method:	RSKSOP 257(1)		Date Collected		6/28/06		6/28/06		6/28/06		6/28/06		6/28/06		6/29/06		
			Date Analyzed		7/17 & 7/19/06		7/17 & 7/19/06		7/17 & 7/19/06		7/17 & 7/19/06		7/17 & 7/19/06		7/17 & 7/19/06		
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names		Codes															
Arsenic (As)		7440-38-2	µg/L	0.027	0.089	120	1	120 (RPD=0.00)	1	121 (RPD=0.83)	1	80.0	1	7.33	1	173	1
Chromium (Cr)		7440-47-3	µg/L	0.094	0.352	2.23	1	2.25(RPD=0.89)	1	2.16 (RPD=3.19)	1	2.14	1	2.20	1	24.8	1
Copper (Cu)		7440-50-8	µg/L	0.034	0.115	2.44	1	2.44 (RPD=0.00)	1	2.33 (RPD=4.61)	1	1.70	1	2.68	1	7.06	1
Lead (Pb)		7439-92-1	µg/L	0.020	0.067	0.519	1	0.505 (RPD=2.73)	1	0.468 (RPD=10.33)	1	0.412	1	0.780	1	8.46	1
Selenium (Se)		7782-49-2	µg/L	0.203	0.677	11.3	1	11.3 (RPD=0.00)	1	11.4 (RPD=0.88)	1	10.4	1	7.13	1	16.1	1
Uranium (U)		7440-61-1	µg/L	0.002	0.008	8.65	1	8.44 (RPD=2.46)	1	8.57 (RPD=0.93)	1	3.62	1	0.896	1	20.8	1
Zinc (Zn)		7440-62-2	µg/L	0.123	0.411	6.52	1	6.54 (RPD=0.31)	1	7.69 (RPD=16.47)	1	4.84	1	7.69	1	24.6	1
Mercury (Hg)		7439-97-6	µg/L	0.033	0.111	BQL(0.037)	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1

Comments:
No problems noted. All QC results met criteria established in RSKSOP 257(1). All iron results were above the QL for ICP analysis, thus iron was not analyzed by ICP-MS. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
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Laboratory: **Metals** Report Date: **7/25/06**

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Technical Directive: **3ME345HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Analysts:	S. Markham/S. Saye	Field Sample ID		ML7-5		ML7-7		ML7-2		ML5-2		ML3-2		ML1-2		
		Sample Lab ID		3449-05		3449-06		3449-07		3449-08		3449-09		3456-01		
Method:	RSKSOP 257(1)	Date Collected		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		
		Date Analyzed		7/17 & 7/19/06		7/17 & 7/19/06		7/17 & 7/19/06		7/17 & 7/19/06		7/17 & 7/19/06		7/17 & 7/19/06		
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	12.0	1	4.72	1	8.79	1	7.04	1	23.8	1	11.3	1
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	2.05	1	1.32		1.20	1	0.746	1	1.15	1	1.67	1
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	1.10	1	1.76		1.81	1	2.45	1	2.24	1	2.00	1
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	0.357	1	0.742	1	0.365	1	0.452	1	0.612	1	0.812	1
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	10.9	1	6.64	1	13.1	1	9.68	1	11.0	1	7.79	1
Uranium (U)	7440-61-1	µg/L	0.002	0.008	15.8	1	8.46	1	0.653	1	0.079	1	0.116	1	0.535	1
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	3.77	1	5.88	1	3.81	1	3.94	1	2.71	1	6.03	1
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	1	ND	1	ND	1	ND	1	ND	1	BQL(0.034)	1

Comments:

No problems noted. All QC results met criteria established in RSKSOP 257(1). All iron results were above the QL for ICP analysis, thus iron was not analyzed by ICP-MS. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 7/25/06

Technical Directive: 3ME345HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 257(1)

Analysts:	S. Markham/S. Saye				Field Sample ID		ML1-2		ML2-2		ML2-2							
					Sample Lab ID		3456-01 Lab Dup.*		3456-02		3456-02 Lab Dup.*							
					Date Collected		6/29/06		6/29/06		6/29/06							
					Date Analyzed		7/17 & 7/19/06		7/17 & 7/19/06		7/19/06							
Method:	RSKSOP 257(1)																	
Analytes				Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names		Codes																
Arsenic (As)		7440-38-2	µg/L	0.027	0.089	11.2 (RPD=0.89)	1	19.4	1	—	—							
Chromium (Cr)		7440-47-3	µg/L	0.094	0.352	1.64 (RPD=1.81)	1	5.01	1	—	—							
Copper (Cu)		7440-50-8	µg/L	0.034	0.115	2.18 (RPD=8.61)	1	4.27	1	—	—							
Lead (Pb)		7439-92-1	µg/L	0.020	0.067	0.795 (RPD=2.12)	1	3.37	1	—	—							
Selenium (Se)		7782-49-2	µg/L	0.203	0.677	7.37 (RPD=5.54)	1	9.21	1	—	—							
Uranium (U)		7440-61-1	µg/L	0.002	0.008	0.541 (RPD=1.12)	1	1.03	1	—	—							
Zinc (Zn)		7440-62-2	µg/L	0.123	0.411	—	—	9.96	1	9.59 (RPD=3.79)	1							
Mercury (Hg)		7439-97-6	µg/L	0.033	0.111	BQL(0.037) (RPD=NA)	1	ND	1	—	—							

Comments:
No problems noted. All QC results met criteria established in RSKSOP 257(1). All iron results were above the QL for ICP analysis, thus iron was not analyzed by ICP-MS. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.

Analytical Technical Directive Results Report

Analytical Results

Laboratory:

Headspace GC/MS

Report Date:

8/23/06

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Technical Directive:

30A814HW

Method:

RSKSOP 259

Analysts:

Tracy Pardue

		Lab Sample ID			3447-01	3447-02	3447-03
		GCMS Tracking ID			Field Blank	PMW-1A	PMW-2A
		Date Collected			6/26/2006	6/26/2006	6/26/2006
		Date Analyzed			8/18/2006	8/18/06, 8/20/06*, 8/22/06**	8/20/2006
		Field Sample ID			Field Blank	PMW-1	PMW-2
Analytes	CAS #	Unit	MDL*	QL*	Data	Data	Data
vinyl chloride	75-01-4	ug/L	0.49	0.5	ND	815	132
1,1-dichloroethene	75-34-4	ug/L	0.15	0.5	ND	11.0	BQL(0.29)
carbon disulfide	75-15-0	ug/L	-	0.5	ND	3.02	0.75
methylene chloride	75-09-2	ug/L	-	0.5	ND	BQL(0.02)	BQL(0.11)
trans-1,2-dichloroethene	156-60-5	ug/L	0.10	0.5	ND	198	27.7
1,1-dichloroethane	75-34-3	ug/L	0.05	0.5	ND	1.42	1.28
cis-1,2-dichloroethene	156-59-2	ug/L	0.06	0.5	ND	18500**	513
chloroform	67-66-3	ug/L	0.09	0.5	ND	BQL(0.22)	BQL(0.19)
1,1,1-trichloroethane	71-55-6	ug/L	0.13	0.5	ND	ND	ND
carbon tetrachloride	56-23-5	ug/L	0.15	0.5	ND	ND	ND
1,2-dichloroethane	107-06-2	ug/L	0.13	0.5	ND	ND	ND
trichloroethene	79-01-6	ug/L	0.07	0.5	ND	3770*	7.10
1,1,2-trichloroethane	95-00-5	ug/L	-	0.5	ND	ND	ND
tetrachloroethene	127-18-4	ug/L	0.17	0.5	BQL(0.21)	853	1.94
chlorobenzene	108-90-7	ug/L	0.18	0.5	ND	ND	ND
1,3-dichlorobenzene	541-73-1	ug/L	0.15	0.5	ND	ND	ND
1,4-dichlorobenzene	106-46-7	ug/L	0.13	0.5	ND	ND	ND
1,2-dichlorobenzene	95-50-1	ug/L	0.09	0.5	ND	1.49	BQL(0.45)
ethanol	64-17-5	µg/L	9.6	50	ND	ND	ND
isopropanol	67-63-0	µg/L	1.5	10	ND	ND	ND
tert-butyl alcohol	75-65-0	µg/L	1.41	5.0	<MDL	BQL(2.2)	6.72
methyl tert-butyl ether	1634-04-4	µg/L	0.11	0.5	ND	ND	BQL(0.40)
di-isopropyl ether	108-20-3	µg/L	0.21	0.5	ND	ND	ND
n-propanol	71-23-8	µg/L	-	50.0	ND	ND	ND
ethyl tert-butyl ether	637-92-3	µg/L	0.17	0.5	ND	ND	ND
benzene	71-43-2	µg/L	0.18	0.5	ND	<MDL	0.64
tert-amyl methyl ether	994-05-8	µg/L	0.11	0.5	ND	ND	BQL(0.18)
n-butanol	71-36-3	µg/L	-	50.0	ND	ND	ND
toluene	108-88-3	µg/L	0.17	0.5	ND	88.2	5.60
ethyl benzene	100-41-4	µg/L	0.17	0.5	ND	10.0	BQL(0.23)
m+p xylene	108-38-3	µg/L	0.25	1.0	ND	13.1	1.02
o-xylene	95-47-6	µg/L	0.16	0.5	ND	1.31	1.62
1,3,5-Trimethylbenzene	108-67-8	µg/L	0.15	0.5	ND	5.12	3.24
1,2,4-Trimethylbenzene	95-63-6	µg/L	0.10	0.5	ND	32.6	8.01
1,2,3-Trimethylbenzene	526-73-8	µg/L	0.06	0.5	ND	2.81	3.43
naphthalene	91-20-3	µg/L	0.12	0.5	ND	1.73	0.51
p-bromofluorobenzene surrogate % rec.	460-00-4	µg/L	-	-	95%	91%	94%
dichlorobenzene_d4 surrogate % rec.	-	µg/L	-	-	93%	102%	91%
dilution factor	-	-	-	-	1.0	1, 10*, 21**	1.0

Comments:

The data quality objective (DQO) for the precision of a laboratory duplicate is a relative percent difference (RPD) of ≤25. The DQO was met for all compounds detected above the quantitation limit. All samples were scanned for the following compounds : ethanol, isopropanol, tert-butyl alcohol, methyl tert-butyl ether, di-isopropyl ether, n-propanol, ethyl tert-butyl ether, benzene, tert-amyl methyl ether, n-butanol, toluene, ethyl benzene, m+p xylene, o-xylene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, 1,2,3-trimethyl benzene and naphthalene. Values for scanned compounds are estimates only, therefore rpd's were not calculated.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable.

2. "-" denotes that the information is not available for the analyte as it was not analyzed. Data for Source Zones, 7-03-06, Headspace GCMS.xls

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Shaw Environmental, Inc.

Analytical Technical Directive Results Report

Analytical Results

Laboratory:

Headspace GC/MS

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Technical Directive:

30A814HW

Method:

RSKSOP 259

Analysts:

Tracy Pardue

		Lab Sample ID			3447-03 Lab Dup	3447-04	3447-05
		GCMS Tracking ID			PMW-2ALD	PMW-6A	PMW-3A
		Date Collected			6/26/2006	6/26/2006	6/26/2006
		Date Analyzed			8/20/2006	8/18/06, 8/20/06*	8/18/06, 8/20/06*, 8/23/06**
		Field Sample ID			PMW-2	PMW-6	PMW-3
Analytes	CAS #	Unit	MDL*	QL*	Data	Data	Data
vinyl chloride	75-01-4	ug/L	0.49	0.5	123 (RPD = 7)	1670*	3760*
1,1-dichloroethene	75-34-4	ug/L	0.15	0.5	BQL(0.27)	6.87	37.1
carbon disulfide	75-15-0	ug/L	-	0.5	0.68 (RPD = 10)	0.66	1.14
methylene chloride	75-09-2	ug/L	-	0.5	BQL(0.11)	ND	BQL(0.17)
trans-1,2-dichloroethene	156-60-5	ug/L	0.10	0.5	26.2 (RPD = 5.6)	449	1570*
1,1-dichloroethane	75-34-3	ug/L	0.05	0.5	1.26 (RPD = 2)	10.2	26.1
cis-1,2-dichloroethene	156-59-2	ug/L	0.06	0.5	492 (RPD - 4.2)	10400*	54100**
chloroform	67-66-3	ug/L	0.09	0.5	BQL(0.17)	ND	BQL(0.23)
1,1,1-trichloroethane	71-55-6	ug/L	0.13	0.5	ND	ND	ND
carbon tetrachloride	56-23-5	ug/L	0.15	0.5	ND	ND	ND
1,2-dichloroethane	107-06-2	ug/L	0.13	0.5	ND	ND	BQL(0.49)
trichloroethene	79-01-6	ug/L	0.07	0.5	6.71 (RPD = 5.6)	1790*	5020*
1,1,2-trichloroethane	95-00-5	ug/L	-	0.5	ND	ND	ND
tetrachloroethene	127-18-4	ug/L	0.17	0.5	2.40 (RPD = 21)	687	13600*
chlorobenzene	108-90-7	ug/L	0.18	0.5	ND	ND	ND
1,3-dichlorobenzene	541-73-1	ug/L	0.15	0.5	ND	ND	ND
1,4-dichlorobenzene	106-46-7	ug/L	0.13	0.5	ND	ND	BQL(0.23)
1,2-dichlorobenzene	95-50-1	ug/L	0.09	0.5	BQL(0.46)	0.82	3.60
ethanol	64-17-5	µg/L	9.6	50	ND	ND	ND
isopropanol	67-63-0	µg/L	1.5	10	ND	ND	ND
tert-butyl alcohol	75-65-0	µg/L	1.41	5.0	6.74	24.9	149
methyl tert-butyl ether	1634-04-4	µg/L	0.11	0.5	BQL(0.43)	1.01	2.39
di-isopropyl ether	108-20-3	µg/L	0.21	0.5	ND	ND	ND
n-propanol	71-23-8	µg/L	-	50.0	ND	ND	ND
ethyl tert-butyl ether	637-92-3	µg/L	0.17	0.5	ND	ND	ND
benzene	71-43-2	µg/L	0.18	0.5	0.57	2.19	1.97
tert-amyl methyl ether	994-05-8	µg/L	0.11	0.5	BQL(0.23)	0.61	BQL(0.39)
n-butanol	71-36-3	µg/L	-	50.0	ND	ND	ND
toluene	108-88-3	µg/L	0.17	0.5	5.22	5.62	30.9
ethyl benzene	100-41-4	µg/L	0.17	0.5	BQL(0.18)	3.59	10.5
m+p xylene	108-38-3	µg/L	0.25	1.0	0.89	3.89	22.1
o-xylene	95-47-6	µg/L	0.16	0.5	1.44	3.86	18.8
1,3,5-Trimethylbenzene	108-67-8	µg/L	0.15	0.5	2.84	5.28	38.0
1,2,4-Trimethylbenzene	95-63-6	µg/L	0.10	0.5	7.46	22.6	131
1,2,3-Trimethylbenzene	526-73-8	µg/L	0.06	0.5	3.12	6.80	33.4
naphthalene	91-20-3	µg/L	0.12	0.5	BQL(0.47)	1.91	3.88
p-bromofluorobenzene surrogate % rec.	460-00-4	µg/L	-	-	92%	94%	92%
dichlorobenzene_d4 surrogate % rec.	-	µg/L	-	-	92%	92%	100%
dilution factor	-	-	-	-	1.0	1 & 10*	1, 21* & 101**

Comments:

The data quality objective (DQO) for the precision of a laboratory duplicate is a relative percent difference (RPD) of ≤25. The DQO was met for all compounds detected above the quantitation limit. All samples were scanned for the following compounds : ethanol, isopropanol, tert-butyl alcohol, methyl tert-butyl ether, di-isopropyl ether, n-propanol, ethyl tert-butyl ether, benzene, tert-amyl methyl ether, n-butanol, toluene, ethyl benzene, m+p xylene, o-xylene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, 1,2,3-trimethyl benzene and naphthalene. Values for scanned compounds are estimates only, therefore rpd's were not calculated.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable.

2. "-" denotes that the information is not available for the analyte as it was not analyzed.

Shaw Environmental, Inc.

Analytical Technical Directive Results Report

Analytical Results

Laboratory:

Headspace GC/MS

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Technical Directive:

30A814HW

Method:

RSKSOP 259

Analysts:

Tracy Pardue

		Lab Sample ID			3447-06	3447-07	3447-08
		GCMS Tracking ID			PMW-4A	PMW-5A	ML1-3A
		Date Collected			6/26/2006	6/27/2006	6/27/2006
		Date Analyzed			8/18/06, 8/20/06*, 8/23/06**	8/18/06, 8/20/06*, 8/23/06**	8/18/06, 8/20/06*
		Field Sample ID			PMW-4	PMW-5	ML1-3
Analytes	CAS #	Unit	MDL*	QL*	Data	Data	Data
vinyl chloride	75-01-4	ug/L	0.49	0.5	72.0	66.5	528
1,1-dichloroethene	75-34-4	ug/L	0.15	0.5	46.3	19.1	2.44
carbon disulfide	75-15-0	ug/L	-	0.5	4.50	2.66	2.69
methylene chloride	75-09-2	ug/L	-	0.5	0.60	1.90	ND
trans-1,2-dichloroethene	156-60-5	ug/L	0.10	0.5	1000	318	137
1,1-dichloroethane	75-34-3	ug/L	0.05	0.5	48.0	19.0	0.76
cis-1,2-dichloroethene	156-59-2	ug/L	0.06	0.5	27200*	19600*	3560*
chloroform	67-66-3	ug/L	0.09	0.5	1.37	0.82	1.74
1,1,1-trichloroethane	71-55-6	ug/L	0.13	0.5	3.44	ND	ND
carbon tetrachloride	56-23-5	ug/L	0.15	0.5	ND	ND	ND
1,2-dichloroethane	107-06-2	ug/L	0.13	0.5	BQL(0.20)	BQL(0.39)	ND
trichloroethene	79-01-6	ug/L	0.07	0.5	18000*	13900*	197
1,1,2-trichloroethane	95-00-5	ug/L	-	0.5	1.25	ND	ND
tetrachloroethene	127-18-4	ug/L	0.17	0.5	76500**	459000**	72.7
chlorobenzene	108-90-7	ug/L	0.18	0.5	BQL(0.26)	ND	ND
1,3-dichlorobenzene	541-73-1	ug/L	0.15	0.5	ND	ND	ND
1,4-dichlorobenzene	106-46-7	ug/L	0.13	0.5	<MDL	ND	ND
1,2-dichlorobenzene	95-50-1	ug/L	0.09	0.5	2.16	8.31	ND
ethanol	64-17-5	µg/L	9.6	50	BQL(37)	BQL(38)	BQL(37)
isopropanol	67-63-0	µg/L	1.5	10	BQL(7.8)	BQL(7.7)	BQL(5.9)
tert-butyl alcohol	75-65-0	µg/L	1.41	5.0	263	117	30.2
methyl tert-butyl ether	1634-04-4	µg/L	0.11	0.5	ND	BQL(0.43)	0.61
di-isopropyl ether	108-20-3	µg/L	0.21	0.5	ND	ND	ND
n-propanol	71-23-8	µg/L	-	50.0	ND	ND	ND
ethyl tert-butyl ether	637-92-3	µg/L	0.17	0.5	ND	ND	ND
benzene	71-43-2	µg/L	0.18	0.5	0.56	0.95	1.37
tert-amyl methyl ether	994-05-8	µg/L	0.11	0.5	BQL(0.29)	BQL(0.20)	BQL(0.39)
n-butanol	71-36-3	µg/L	-	50.0	ND	ND	ND
toluene	108-88-3	µg/L	0.17	0.5	49.9	26.0	0.94
ethyl benzene	100-41-4	µg/L	0.17	0.5	17.8	7.50	ND
m+p xylene	108-38-3	µg/L	0.25	1.0	24.0	19.5	ND
o-xylene	95-47-6	µg/L	0.16	0.5	13.4	13.3	BQL(0.18)
1,3,5-Trimethylbenzene	108-67-8	µg/L	0.15	0.5	9.71	30.8	ND
1,2,4-Trimethylbenzene	95-63-6	µg/L	0.10	0.5	152	97.2	1.06
1,2,3-Trimethylbenzene	526-73-8	µg/L	0.06	0.5	16.6	23.9	BQL(0.15)
naphthalene	91-20-3	µg/L	0.12	0.5	25.1	12.7	<MDL
p-bromofluorobenzene surrogate % rec.	460-00-4	µg/L	-	-	87%	95%	102%
dichlorobenzene_d4 surrogate % rec.	-	µg/L	-	-	99%	94%	96%
dilution factor	-	-	-	-	1, 41* & 101**	1, 51* & 401**	1 & 10*

Comments:

The data quality objective (DQO) for the precision of a laboratory duplicate is a relative percent difference (RPD) of ≤25. The DQO was met for all compounds detected above the quantitation limit. All samples were scanned for the following compounds : ethanol, isopropanol, tert-butyl alcohol, methyl tert-butyl ether, di-isopropyl ether, n-propanol, ethyl tert-butyl ether, benzene, tert-amyl methyl ether, n-butanol, toluene, ethyl benzene, m+p xylene, o-xylene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, 1,2,3-trimethyl benzene and naphthalene. Values for scanned compounds are estimates only, therefore rpd's were not calculated.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable.

2. "-" denotes that the information is not available for the analyte as it was not analyzed.

Shaw Environmental, Inc.

Analytical Technical Directive Results Report

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Laboratory:

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Technical Directive:

30A814HW

Method:

RSKSOP 259

Analysts:

Tracy Pardue

		Lab Sample ID			3447-09	3447-09 Lab Dup	3447-10
		GCMS Tracking ID			ML1-5A	ML1-5ALD	ML1-7A
		Date Collected			6/27/2006	6/27/2006	6/27/2006
		Date Analyzed			8/20/2006	8/20/2006	8/19/2006
		Field Sample ID			ML1-5	ML1-5	ML1-7
Analytes	CAS #	Unit	MDL*	QL*	Data	Data	Data
vinyl chloride	75-01-4	ug/L	0.49	0.5	93.9	84.9 (RPD = 10)	4.08
1,1-dichloroethene	75-34-4	ug/L	0.15	0.5	BQL(0.17)	BQL(0.14)	ND
carbon disulfide	75-15-0	ug/L	-	0.5	1.31	1.26 (RPD = 4)	ND
methylene chloride	75-09-2	ug/L	-	0.5	BQL(0.02)	BQL(0.01)	BQL(0.01)
trans-1,2-dichloroethene	156-60-5	ug/L	0.10	0.5	25.3	23.7 (RPD = 6.5)	1.15
1,1-dichloroethane	75-34-3	ug/L	0.05	0.5	BQL(0.22)	BQL(0.21)	ND
cis-1,2-dichloroethene	156-59-2	ug/L	0.06	0.5	578	562 (RPD = 2.8)	41.7
chloroform	67-66-3	ug/L	0.09	0.5	2.30	2.19 (RPD =4.9)	3.01
1,1,1-trichloroethane	71-55-6	ug/L	0.13	0.5	ND	ND	ND
carbon tetrachloride	56-23-5	ug/L	0.15	0.5	ND	ND	ND
1,2-dichloroethane	107-06-2	ug/L	0.13	0.5	ND	ND	ND
trichloroethene	79-01-6	ug/L	0.07	0.5	26.8	24.8 (RPD = 8)	9.44
1,1,2-trichloroethane	95-00-5	ug/L	-	0.5	ND	ND	ND
tetrachloroethene	127-18-4	ug/L	0.17	0.5	19.3	19.0 (RPD = 2)	13.4
chlorobenzene	108-90-7	ug/L	0.18	0.5	ND	ND	ND
1,3-dichlorobenzene	541-73-1	ug/L	0.15	0.5	ND	ND	ND
1,4-dichlorobenzene	106-46-7	ug/L	0.13	0.5	ND	ND	ND
1,2-dichlorobenzene	95-50-1	ug/L	0.09	0.5	ND	ND	ND
ethanol	64-17-5	µg/L	9.6	50	BQL(36)	BQL(37)	113
isopropanol	67-63-0	µg/L	1.5	10	4.42	4.31	BQL(3.8)
tert-butyl alcohol	75-65-0	µg/L	1.41	5.0	9.50	9.40	BQL(1.9)
methyl tert-butyl ether	1634-04-4	µg/L	0.11	0.5	BQL(0.21)	BQL(0.26)	ND
di-isopropyl ether	108-20-3	µg/L	0.21	0.5	ND	ND	ND
n-propanol	71-23-8	µg/L	-	50.0	ND	ND	ND
ethyl tert-butyl ether	637-92-3	µg/L	0.17	0.5	ND	ND	ND
benzene	71-43-2	µg/L	0.18	0.5	BQL(0.24)	BQL(0.20)	ND
tert-amyl methyl ether	994-05-8	µg/L	0.11	0.5	<MDL	BQL(0.15)	ND
n-butanol	71-36-3	µg/L	-	50.0	ND	ND	ND
toluene	108-88-3	µg/L	0.17	0.5	<MDL	<MDL	ND
ethyl benzene	100-41-4	µg/L	0.17	0.5	ND	ND	ND
m+p xylene	108-38-3	µg/L	0.25	1.0	ND	ND	ND
o-xylene	95-47-6	µg/L	0.16	0.5	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	µg/L	0.15	0.5	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	µg/L	0.10	0.5	BQL(0.45)	BQL(0.43)	ND
1,2,3-Trimethylbenzene	526-73-8	µg/L	0.06	0.5	ND	ND	ND
naphthalene	91-20-3	µg/L	0.12	0.5	ND	ND	ND
p-bromofluorobenzene surrogate % rec.	460-00-4	µg/L	-	-	91%	91%	93%
dichlorobenzene_d4 surrogate % rec.	-	µg/L	-	-	91%	84%	95%
dilution factor	-	-	-	-	1.0	1.0	1.0

Comments:

The data quality objective (DQO) for the precision of a laboratory duplicate is a relative percent difference (RPD) of ≤25. The DQO was met for all compounds detected above the quantitation limit. All samples were scanned for the following compounds : ethanol, isopropanol, tert-butyl alcohol, methyl tert-butyl ether, di-isopropyl ether, n-propanol, ethyl tert-butyl ether, benzene, tert-amyl methyl ether, n-butanol, toluene, ethyl benzene, m+p xylene, o-xylene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, 1,2,3-trimethyl benzene and naphthalene. Values for scanned compounds are estimates only, therefore rpd's were not calculated.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable.

2. "-" denotes that the information is not available for the analyte as it was not analyzed.

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Shaw Environmental, Inc.

Analytical Technical Directive Results Report

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Technical Directive:

30A814HW

Method:

RSKSOP 259

Analysts:

Tracy Pardue

		Lab Sample ID			3447-11	3447-12	3447-13
		GCMS Tracking ID			ML2-3A	ML2-5A	ML2-7A
		Date Collected			6/27/2006	6/27/2006	6/27/2006
		Date Analyzed			8/19/06, 8/21/06*	8/19/06, 8/21/06*, 8/23/06**	8/19/06, 8/21/06*
		Field Sample ID			ML2-3	ML2-5	ML2-7
Analytes	CAS #	Unit	MDL*	QL*	Data	Data	Data
vinyl chloride	75-01-4	ug/L	0.49	0.5	320	52.9	270
1,1-dichloroethene	75-34-4	ug/L	0.15	0.5	20.9	3.12	1.22
carbon disulfide	75-15-0	ug/L	-	0.5	BQL(0.42)	BQL(0.15)	BQL(0.15)
methylene chloride	75-09-2	ug/L	-	0.5	BQL(0.13)	ND	ND
trans-1,2-dichloroethene	156-60-5	ug/L	0.10	0.5	149	12.1	73.4
1,1-dichloroethane	75-34-3	ug/L	0.05	0.5	3.80	0.62	2.15
cis-1,2-dichloroethene	156-59-2	ug/L	0.06	0.5	9580*	545	1870*
chloroform	67-66-3	ug/L	0.09	0.5	0.85	BQL(0.17)	3.09
1,1,1-trichloroethane	71-55-6	ug/L	0.13	0.5	<MDL	ND	BQL(0.15)
carbon tetrachloride	56-23-5	ug/L	0.15	0.5	ND	ND	ND
1,2-dichloroethane	107-06-2	ug/L	0.13	0.5	ND	ND	ND
trichloroethene	79-01-6	ug/L	0.07	0.5	11300*	3510*	359
1,1,2-trichloroethane	95-00-5	ug/L	-	0.5	ND	ND	ND
tetrachloroethene	127-18-4	ug/L	0.17	0.5	45700*	167000**	829
chlorobenzene	108-90-7	ug/L	0.18	0.5	ND	ND	ND
1,3-dichlorobenzene	541-73-1	ug/L	0.15	0.5	ND	ND	ND
1,4-dichlorobenzene	106-46-7	ug/L	0.13	0.5	BQL(0.23)	2.23	ND
1,2-dichlorobenzene	95-50-1	ug/L	0.09	0.5	2.89	19.6	ND
ethanol	64-17-5	µg/L	9.6	50	BQL(37)	ND	BQL(44)
isopropanol	67-63-0	µg/L	1.5	10	BQL(6.7)	ND	BQL(4.8)
tert-butyl alcohol	75-65-0	µg/L	1.41	5.0	37.2	BQL(1.9)	16.0
methyl tert-butyl ether	1634-04-4	µg/L	0.11	0.5	0.86	0.51	BQL(0.17)
di-isopropyl ether	108-20-3	µg/L	0.21	0.5	ND	ND	ND
n-propanol	71-23-8	µg/L	-	50.0	ND	ND	ND
ethyl tert-butyl ether	637-92-3	µg/L	0.17	0.5	ND	ND	ND
benzene	71-43-2	µg/L	0.18	0.5	1.65	0.71	BQL(0.28)
tert-amyl methyl ether	994-05-8	µg/L	0.11	0.5	0.70	BQL(0.30)	<MDL
n-butanol	71-36-3	µg/L	-	50.0	ND	ND	ND
toluene	108-88-3	µg/L	0.17	0.5	8.75	16.2	0.61
ethyl benzene	100-41-4	µg/L	0.17	0.5	3.22	9.55	ND
m+p xylene	108-38-3	µg/L	0.25	1.0	9.27	26.9	ND
o-xylene	95-47-6	µg/L	0.16	0.5	5.97	17.9	<MDL
1,3,5-Trimethylbenzene	108-67-8	µg/L	0.15	0.5	22.8	78.6	<MDL
1,2,4-Trimethylbenzene	95-63-6	µg/L	0.10	0.5	70.2	243	1.18
1,2,3-Trimethylbenzene	526-73-8	µg/L	0.06	0.5	20.2	64.3	BQL(0.25)
naphthalene	91-20-3	µg/L	0.12	0.5	8.20	38.6	<MDL
p-bromofluorobenzene surrogate % rec.	460-00-4	µg/L	-	-	97%	94%	90%
dichlorobenzene_d4 surrogate % rec.	-	µg/L	-	-	99%	93%	89%
dilution factor	-	-	-	-	1 & 41*	1, 10* & 501**	1 & 5*

Comments:

The data quality objective (DQO) for the precision of a laboratory duplicate is a relative percent difference (RPD) of ≤25. The DQO was met for all compounds detected above the quantitation limit. All samples were scanned for the following compounds : ethanol, isopropanol, tert-butyl alcohol, methyl tert-butyl ether, di-isopropyl ether, n-propanol, ethyl tert-butyl ether, benzene, tert-amyl methyl ether, n-butanol, toluene, ethyl benzene, m+p xylene, o-xylene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, 1,2,3-trimethyl benzene and naphthalene. Values for scanned compounds are estimates only, therefore rpd's were not calculated.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable.

2. "-" denotes that the information is not available for the analyte as it was not analyzed. Source: Nano Iron for Source Zones, 7-03-06, Headspace GCMS.xls Data

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Technical Directive:

30A814HW

Method:

RSKSOP 259

Analysts:

Tracy Pardue

		Lab Sample ID			3447-14	3447-15	3447-15 Lab Dup
		GCMS Tracking ID			ML3-3A	ML3-5A	ML3-5ALD
		Date Collected			6/27/2006	6/27/2006	6/27/2006
		Date Analyzed			8/19/06, 8/21/06*	8/21/2006	8/21/2006
		Field Sample ID			ML3-3	ML3-5	ML3-5
Analytes	CAS #	Unit	MDL*	QL*	Data	Data	Data
vinyl chloride	75-01-4	ug/L	0.49	0.5	3210*	38.6	37.6 (RPD = 3)
1,1-dichloroethene	75-34-4	ug/L	0.15	0.5	3.77	<MDL	<MDL
carbon disulfide	75-15-0	ug/L	-	0.5	BQL(0.09)	ND	ND
methylene chloride	75-09-2	ug/L	-	0.5	ND	BQL(0.14)	BQL(0.14)
trans-1,2-dichloroethene	156-60-5	ug/L	0.10	0.5	294	11.2	11.2 (RPD = 0)
1,1-dichloroethane	75-34-3	ug/L	0.05	0.5	11.5	ND	ND
cis-1,2-dichloroethene	156-59-2	ug/L	0.06	0.5	2970*	245	241 (RPD = 2)
chloroform	67-66-3	ug/L	0.09	0.5	0.98	<MDL	<MDL
1,1,1-trichloroethane	71-55-6	ug/L	0.13	0.5	ND	ND	ND
carbon tetrachloride	56-23-5	ug/L	0.15	0.5	ND	ND	ND
1,2-dichloroethane	107-06-2	ug/L	0.13	0.5	ND	ND	ND
trichloroethene	79-01-6	ug/L	0.07	0.5	38.3	10.8	10.9 (RPD = 0.9)
1,1,2-trichloroethane	95-00-5	ug/L	-	0.5	ND	ND	ND
tetrachloroethene	127-18-4	ug/L	0.17	0.5	128	777	750 (RPD = 3.5)
chlorobenzene	108-90-7	ug/L	0.18	0.5	ND	ND	ND
1,3-dichlorobenzene	541-73-1	ug/L	0.15	0.5	ND	ND	ND
1,4-dichlorobenzene	106-46-7	ug/L	0.13	0.5	ND	ND	ND
1,2-dichlorobenzene	95-50-1	ug/L	0.09	0.5	BQL(0.36)	ND	ND
ethanol	64-17-5	µg/L	9.6	50	50.0	BQL(36)	BQL(36)
isopropanol	67-63-0	µg/L	1.5	10	BQL(4.4)	ND	ND
tert-butyl alcohol	75-65-0	µg/L	1.41	5.0	29.8	<MDL	<MDL
methyl tert-butyl ether	1634-04-4	µg/L	0.11	0.5	BQL(0.38)	BQL(0.42)	BQL(0.47)
di-isopropyl ether	108-20-3	µg/L	0.21	0.5	ND	ND	ND
n-propanol	71-23-8	µg/L	-	50.0	ND	ND	ND
ethyl tert-butyl ether	637-92-3	µg/L	0.17	0.5	ND	ND	ND
benzene	71-43-2	µg/L	0.18	0.5	1.16	1.59	1.43
tert-amyl methyl ether	994-05-8	µg/L	0.11	0.5	BQL(0.22)	BQL(0.26)	BQL(0.25)
n-butanol	71-36-3	µg/L	-	50.0	ND	ND	ND
toluene	108-88-3	µg/L	0.17	0.5	18.5	<MDL	<MDL
ethyl benzene	100-41-4	µg/L	0.17	0.5	0.94	ND	ND
m+p xylene	108-38-3	µg/L	0.25	1.0	6.72	ND	ND
o-xylene	95-47-6	µg/L	0.16	0.5	7.33	ND	ND
1,3,5-Trimethylbenzene	108-67-8	µg/L	0.15	0.5	4.30	0.55	BQL(0.48)
1,2,4-Trimethylbenzene	95-63-6	µg/L	0.10	0.5	19.8	2.75	2.48
1,2,3-Trimethylbenzene	526-73-8	µg/L	0.06	0.5	7.57	BQL(0.36)	BQL(0.34)
naphthalene	91-20-3	µg/L	0.12	0.5	BQL(0.15)	<MDL	<MDL
p-bromofluorobenzene surrogate % rec.	460-00-4	µg/L	-	-	91%	88%	88%
dichlorobenzene_d4 surrogate % rec.	-	µg/L	-	-	95%	88%	86%
dilution factor	-	-	-	-	1 & 5*	1.0	1.0

Comments:

The data quality objective (DQO) for the precision of a laboratory duplicate is a relative percent difference (RPD) of ≤25. The DQO was met for all compounds detected above the quantitation limit. All samples were scanned for the following compounds : ethanol, isopropanol, tert-butyl alcohol, methyl tert-butyl ether, di-isopropyl ether, n-propanol, ethyl tert-butyl ether, benzene, tert-amyl methyl ether, n-butanol, toluene, ethyl benzene, m+p xylene, o-xylene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, 1,2,3-trimethyl benzene and naphthalene. Values for scanned compounds are estimates only, therefore rpd's were not calculated.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable.

2. "-" denotes that the information is not available for the analyte as it was not analyzed.

Shaw Environmental, Inc.

Analytical Technical Directive Results Report

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30A814HW

Method:

RSKSOP 259

Analysts:

Tracy Pardue

		Lab Sample ID			3447-16	3447-17	3447-18
		GCMS Tracking ID			ML3-7A	ML3-7A Dup	ML4-3A
		Date Collected			6/27/2006	6/27/2006	6/28/2006
		Date Analyzed			8/19/2006	8/19/2006	8/19/06, 8/21/06*, 8/21/06**
		Field Sample ID			ML3-7	ML3-7 Dup	ML4-3
Analytes	CAS #	Unit	MDL*	QL*	Data	Data	Data
vinyl chloride	75-01-4	ug/L	0.49	0.5	45.4	45.8	4930*
1,1-dichloroethene	75-34-4	ug/L	0.15	0.5	ND	ND	37.8
carbon disulfide	75-15-0	ug/L	-	0.5	BQL(0.09)	ND	BQL(0.14)
methylene chloride	75-09-2	ug/L	-	0.5	ND	ND	BQL(0.08)
trans-1,2-dichloroethene	156-60-5	ug/L	0.10	0.5	5.43	5.96	1490*
1,1-dichloroethane	75-34-3	ug/L	0.05	0.5	BQL(0.18)	BQL(0.15)	26.4
cis-1,2-dichloroethene	156-59-2	ug/L	0.06	0.5	196	194	45600**
chloroform	67-66-3	ug/L	0.09	0.5	1.63	1.38	BQL(0.29)
1,1,1-trichloroethane	71-55-6	ug/L	0.13	0.5	ND	ND	ND
carbon tetrachloride	56-23-5	ug/L	0.15	0.5	ND	ND	ND
1,2-dichloroethane	107-06-2	ug/L	0.13	0.5	ND	ND	BQL(0.33)
trichloroethene	79-01-6	ug/L	0.07	0.5	21.1	20.3	4220*
1,1,2-trichloroethane	95-00-5	ug/L	-	0.5	ND	ND	ND
tetrachloroethene	127-18-4	ug/L	0.17	0.5	66.9	70.8	668
chlorobenzene	108-90-7	ug/L	0.18	0.5	ND	ND	ND
1,3-dichlorobenzene	541-73-1	ug/L	0.15	0.5	ND	ND	ND
1,4-dichlorobenzene	106-46-7	ug/L	0.13	0.5	ND	ND	<MDL
1,2-dichlorobenzene	95-50-1	ug/L	0.09	0.5	ND	ND	2.21
ethanol	64-17-5	µg/L	9.6	50	581	411	ND
isopropanol	67-63-0	µg/L	1.5	10	BQL(7.7)	BQL(7.5)	<MDL
tert-butyl alcohol	75-65-0	µg/L	1.41	5.0	BQL(3.5)	BQL(3.2)	121
methyl tert-butyl ether	1634-04-4	µg/L	0.11	0.5	<MDL	BQL(0.11)	2.22
di-isopropyl ether	108-20-3	µg/L	0.21	0.5	ND	ND	ND
n-propanol	71-23-8	µg/L	-	50.0	ND	ND	ND
ethyl tert-butyl ether	637-92-3	µg/L	0.17	0.5	ND	ND	ND
benzene	71-43-2	µg/L	0.18	0.5	<MDL	<MDL	2.93
tert-amyl methyl ether	994-05-8	µg/L	0.11	0.5	ND	ND	0.82
n-butanol	71-36-3	µg/L	-	50.0	ND	ND	ND
toluene	108-88-3	µg/L	0.17	0.5	0.68	0.64	25.4
ethyl benzene	100-41-4	µg/L	0.17	0.5	ND	ND	11.8
m+p xylene	108-38-3	µg/L	0.25	1.0	<MDL	<MDL	19.1
o-xylene	95-47-6	µg/L	0.16	0.5	BQL(0.37)	BQL(0.39)	15.8
1,3,5-Trimethylbenzene	108-67-8	µg/L	0.15	0.5	1.88	1.95	22.2
1,2,4-Trimethylbenzene	95-63-6	µg/L	0.10	0.5	7.39	7.81	106
1,2,3-Trimethylbenzene	526-73-8	µg/L	0.06	0.5	1.30	1.33	26.3
naphthalene	91-20-3	µg/L	0.12	0.5	BQL(0.16)	BQL(0.15)	1.39
p-bromofluorobenzene surrogate % rec.	460-00-4	µg/L	-	-	90%	90%	91%
dichlorobenzene_d4 surrogate % rec.	-	µg/L	-	-	90%	89%	95%
dilution factor	-	-	-	-	1.0	1.0	1, 10* & 51**

Comments:

The data quality objective (DQO) for the precision of a laboratory duplicate is a relative percent difference (RPD) of ≤25. The DQO was met for all compounds detected above the quantitation limit. All samples were scanned for the following compounds : ethanol, isopropanol, tert-butyl alcohol, methyl tert-butyl ether, di-isopropyl ether, n-propanol, ethyl tert-butyl ether, benzene, tert-amyl methyl ether, n-butanol, toluene, ethyl benzene, m+p xylene, o-xylene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, 1,2,3-trimethyl benzene and naphthalene. Values for scanned compounds are estimates only, therefore rpd's were not calculated.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable.

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Shaw Environmental, Inc.

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Technical Directive:

30A814HW

Method:

RSKSOP 259

Analysts:

Tracy Pardue

		Lab Sample ID			3447-19	3447-20	3447-21
		GCMS Tracking ID			ML4-5A	ML4-7A	ML5-3A
		Date Collected			6/28/2006	6/28/2006	6/28/2006
		Date Analyzed			8/19/06, 8/23/06*	8/19/2006	8/19/06, 8/21/06*, 8/23/06**
		Field Sample ID			ML4-5	ML4-7	ML5-3
Analytes	CAS #	Unit	MDL*	QL*	Data	Data	Data
vinyl chloride	75-01-4	ug/L	0.49	0.5	300	34.7	3130*
1,1-dichloroethene	75-34-4	ug/L	0.15	0.5	2.14	<MDL	65.0
carbon disulfide	75-15-0	ug/L	-	0.5	BQL(0.19)	BQL(0.16)	BQL(0.14)
methylene chloride	75-09-2	ug/L	-	0.5	ND	ND	BQL(0.40)
trans-1,2-dichloroethene	156-60-5	ug/L	0.10	0.5	77.3	8.97	2770*
1,1-dichloroethane	75-34-3	ug/L	0.05	0.5	1.45	ND	41.3
cis-1,2-dichloroethene	156-59-2	ug/L	0.06	0.5	2180*	243	81000**
chloroform	67-66-3	ug/L	0.09	0.5	0.54	1.85	0.87
1,1,1-trichloroethane	71-55-6	ug/L	0.13	0.5	ND	ND	ND
carbon tetrachloride	56-23-5	ug/L	0.15	0.5	ND	ND	ND
1,2-dichloroethane	107-06-2	ug/L	0.13	0.5	ND	ND	1.01
trichloroethene	79-01-6	ug/L	0.07	0.5	835	9.70	10000*
1,1,2-trichloroethane	95-00-5	ug/L	-	0.5	ND	ND	ND
tetrachloroethene	127-18-4	ug/L	0.17	0.5	1640*	11.1	2650*
chlorobenzene	108-90-7	ug/L	0.18	0.5	ND	ND	<MDL
1,3-dichlorobenzene	541-73-1	ug/L	0.15	0.5	ND	ND	ND
1,4-dichlorobenzene	106-46-7	ug/L	0.13	0.5	ND	ND	BQL(0.27)
1,2-dichlorobenzene	95-50-1	ug/L	0.09	0.5	ND	ND	3.53
ethanol	64-17-5	µg/L	9.6	50	BQL(33)	78.6	ND
isopropanol	67-63-0	µg/L	1.5	10	ND	BQL(3.5)	BQL(2.3)
tert-butyl alcohol	75-65-0	µg/L	1.41	5.0	6.42	BQL(2.8)	217
methyl tert-butyl ether	1634-04-4	µg/L	0.11	0.5	BQL(0.47)	ND	ND
di-isopropyl ether	108-20-3	µg/L	0.21	0.5	ND	ND	ND
n-propanol	71-23-8	µg/L	-	50.0	ND	ND	ND
ethyl tert-butyl ether	637-92-3	µg/L	0.17	0.5	ND	ND	ND
benzene	71-43-2	µg/L	0.18	0.5	1.82	ND	1.58
tert-amyl methyl ether	994-05-8	µg/L	0.11	0.5	BQL(0.35)	ND	BQL(0.22)
n-butanol	71-36-3	µg/L	-	50.0	ND	ND	ND
toluene	108-88-3	µg/L	0.17	0.5	2.41	<MDL	46.6
ethyl benzene	100-41-4	µg/L	0.17	0.5	BQL(0.34)	ND	15.1
m+p xylene	108-38-3	µg/L	0.25	1.0	2.16	ND	27.2
o-xylene	95-47-6	µg/L	0.16	0.5	2.02	<MDL	21.0
1,3,5-Trimethylbenzene	108-67-8	µg/L	0.15	0.5	6.05	1.14	33.8
1,2,4-Trimethylbenzene	95-63-6	µg/L	0.10	0.5	20.8	3.74	127
1,2,3-Trimethylbenzene	526-73-8	µg/L	0.06	0.5	3.97	0.56	33.8
naphthalene	91-20-3	µg/L	0.12	0.5	BQL(0.48)	ND	2.04
p-bromofluorobenzene surrogate % rec.	460-00-4	µg/L	-	-	89%	90%	91%
dichlorobenzene_d4 surrogate % rec.	-	µg/L	-	-	89%	90%	100%
dilution factor	-	-	-	-	1 & 10*	1.0	1, 51* & 101**

Comments:

The data quality objective (DQO) for the precision of a laboratory duplicate is a relative percent difference (RPD) of ≤25. The DQO was met for all compounds detected above the quantitation limit. All samples were scanned for the following compounds : ethanol, isopropanol, tert-butyl alcohol, methyl tert-butyl ether, di-isopropyl ether, n-propanol, ethyl tert-butyl ether, benzene, tert-amyl methyl ether, n-butanol, toluene, ethyl benzene, m+p xylene, o-xylene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, 1,2,3-trimethyl benzene and naphthalene. Values for scanned compounds are estimates only, therefore rpd's were not calculated.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable.

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Shaw Environmental, Inc.

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30A814HW

Method:

RSKSOP 259

Analysts:

Tracy Pardue

		Lab Sample ID			3447-22	3447-23	3449-01
		GCMS Tracking ID			ML5-5A	ML5-7A	ML6-3A
		Date Collected			6/28/2006	6/28/2006	6/28/2006
		Date Analyzed			8/19/2006	8/19/06, 8/23/06*	8/19/06, 8/22/06*, 8/23/06**
		Field Sample ID			ML5-5	ML5-7	ML6-3
Analytes	CAS #	Unit	MDL*	QL*	Data	Data	Data
vinyl chloride	75-01-4	ug/L	0.49	0.5	195	68.7	2450*
1,1-dichloroethene	75-34-4	ug/L	0.15	0.5	5.12	1.39	66.4
carbon disulfide	75-15-0	ug/L	-	0.5	BQL(0.19)	BQL(0.11)	BQL(0.13)
methylene chloride	75-09-2	ug/L	-	0.5	ND	BQL(0.07)	BQL(0.38)
trans-1,2-dichloroethene	156-60-5	ug/L	0.10	0.5	139	56.6	2710*
1,1-dichloroethane	75-34-3	ug/L	0.05	0.5	3.10	1.14	38.7
cis-1,2-dichloroethene	156-59-2	ug/L	0.06	0.5	5290*	1850*	83000**
chloroform	67-66-3	ug/L	0.09	0.5	2.63	7.06	1.14
1,1,1-trichloroethane	71-55-6	ug/L	0.13	0.5	ND	ND	ND
carbon tetrachloride	56-23-5	ug/L	0.15	0.5	ND	ND	ND
1,2-dichloroethane	107-06-2	ug/L	0.13	0.5	ND	ND	0.92
trichloroethene	79-01-6	ug/L	0.07	0.5	5090*	846	9210*
1,1,2-trichloroethane	95-00-5	ug/L	-	0.5	ND	ND	ND
tetrachloroethene	127-18-4	ug/L	0.17	0.5	6560*	377	2760*
chlorobenzene	108-90-7	ug/L	0.18	0.5	ND	ND	<MDL
1,3-dichlorobenzene	541-73-1	ug/L	0.15	0.5	ND	ND	ND
1,4-dichlorobenzene	106-46-7	ug/L	0.13	0.5	ND	ND	BQL(0.18)
1,2-dichlorobenzene	95-50-1	ug/L	0.09	0.5	0.69	ND	2.98
ethanol	64-17-5	µg/L	9.6	50	BQL(33)	73.1	ND
isopropanol	67-63-0	µg/L	1.5	10	BQL(3.4)	BQL(8.4)	BQL(2.1)
tert-butyl alcohol	75-65-0	µg/L	1.41	5.0	16.3	6.46	228
methyl tert-butyl ether	1634-04-4	µg/L	0.11	0.5	1.17	<MDL	4.80
di-isopropyl ether	108-20-3	µg/L	0.21	0.5	ND	ND	ND
n-propanol	71-23-8	µg/L	-	50.0	ND	ND	ND
ethyl tert-butyl ether	637-92-3	µg/L	0.17	0.5	ND	ND	ND
benzene	71-43-2	µg/L	0.18	0.5	2.63	<MDL	1.39
tert-amyl methyl ether	994-05-8	µg/L	0.11	0.5	1.11	ND	BQL(0.11)
n-butanol	71-36-3	µg/L	-	50.0	ND	ND	ND
toluene	108-88-3	µg/L	0.17	0.5	3.80	0.94	45.9
ethyl benzene	100-41-4	µg/L	0.17	0.5	1.00	ND	14.9
m+p xylene	108-38-3	µg/L	0.25	1.0	1.43	BQL(0.34)	25.1
o-xylene	95-47-6	µg/L	0.16	0.5	2.06	0.78	18.6
1,3,5-Trimethylbenzene	108-67-8	µg/L	0.15	0.5	7.57	4.30	29.1
1,2,4-Trimethylbenzene	95-63-6	µg/L	0.10	0.5	21.6	14.4	114
1,2,3-Trimethylbenzene	526-73-8	µg/L	0.06	0.5	4.65	2.86	29.7
naphthalene	91-20-3	µg/L	0.12	0.5	1.28	BQL(0.44)	1.93
p-bromofluorobenzene surrogate % rec.	460-00-4	µg/L	-	-	91%	85%	92%
dichlorobenzene_d4 surrogate % rec.	-	µg/L	-	-	90%	80%	99%
dilution factor	-	-	-	-	1 & 51*	1 & 10*	1, 51* & 401**

Comments:

The data quality objective (DQO) for the precision of a laboratory duplicate is a relative percent difference (RPD) of ≤25. The DQO was met for all compounds detected above the quantitation limit. All samples were scanned for the following compounds : ethanol, isopropanol, tert-butyl alcohol, methyl tert-butyl ether, di-isopropyl ether, n-propanol, ethyl tert-butyl ether, benzene, tert-amyl methyl ether, n-butanol, toluene, ethyl benzene, m+p xylene, o-xylene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, 1,2,3-trimethyl benzene and naphthalene. Values for scanned compounds are estimates only, therefore rpd's were not calculated.

Notes:

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30A814HW

Method:

RSKSOP 259

Analysts:

Tracy Pardue

		Lab Sample ID			3449-02	3449-03	3449-03 Lab Dup
		GCMS Tracking ID			ML6-5A	ML6-7A	ML6-7ALD
		Date Collected			6/28/2006	6/28/2006	6/28/2006
		Date Analyzed			8/19/06, 8/22/06*, 8/23/06**	8/22/2006	8/22/2006
		Field Sample ID			ML6-5	ML6-7	ML6-7
Analytes	CAS #	Unit	MDL*	QL*	Data	Data	Data
vinyl chloride	75-01-4	ug/L	0.49	0.5	3050*	7.25	6.87 (RPD = 5.4)
1,1-dichloroethene	75-34-4	ug/L	0.15	0.5	73.9	BQL(0.18)	<MDL
carbon disulfide	75-15-0	ug/L	-	0.5	BQL(0.12)	ND	ND
methylene chloride	75-09-2	ug/L	-	0.5	BQL(0.43)	BQL(0.33)	BQL(0.35)
trans-1,2-dichloroethene	156-60-5	ug/L	0.10	0.5	3020*	13.0	12.3 (RPD = 6)
1,1-dichloroethane	75-34-3	ug/L	0.05	0.5	44.1	BQL(0.29)	BQL(0.23)
cis-1,2-dichloroethene	156-59-2	ug/L	0.06	0.5	86400**	490	473 (RPD = 3.5)
chloroform	67-66-3	ug/L	0.09	0.5	0.52	6.40	6.11 (RPD =4.6)
1,1,1-trichloroethane	71-55-6	ug/L	0.13	0.5	ND	ND	ND
carbon tetrachloride	56-23-5	ug/L	0.15	0.5	ND	ND	ND
1,2-dichloroethane	107-06-2	ug/L	0.13	0.5	0.93	ND	ND
trichloroethene	79-01-6	ug/L	0.07	0.5	10400*	12.9	12.2 (RPD = 6)
1,1,2-trichloroethane	95-00-5	ug/L	-	0.5	ND	ND	ND
tetrachloroethene	127-18-4	ug/L	0.17	0.5	3070*	27.0	25.8 (RPD = 4.5)
chlorobenzene	108-90-7	ug/L	0.18	0.5	<MDL	ND	ND
1,3-dichlorobenzene	541-73-1	ug/L	0.15	0.5	ND	ND	ND
1,4-dichlorobenzene	106-46-7	ug/L	0.13	0.5	BQL(0.27)	ND	ND
1,2-dichlorobenzene	95-50-1	ug/L	0.09	0.5	3.89	ND	ND
ethanol	64-17-5	µg/L	9.6	50	ND	517	516
isopropanol	67-63-0	µg/L	1.5	10	ND	BQL(8.2)	BQL(8.2)
tert-butyl alcohol	75-65-0	µg/L	1.41	5.0	258	BQL(4.6)	BQL(5.0)
methyl tert-butyl ether	1634-04-4	µg/L	0.11	0.5	5.46	ND	ND
di-isopropyl ether	108-20-3	µg/L	0.21	0.5	ND	ND	ND
n-propanol	71-23-8	µg/L	-	50.0	ND	ND	ND
ethyl tert-butyl ether	637-92-3	µg/L	0.17	0.5	ND	ND	ND
benzene	71-43-2	µg/L	0.18	0.5	1.49	ND	ND
tert-amyl methyl ether	994-05-8	µg/L	0.11	0.5	<MDL	ND	ND
n-butanol	71-36-3	µg/L	-	50.0	ND	BQL(31)	BQL(46)
toluene	108-88-3	µg/L	0.17	0.5	52.4	BQL(0.25)	BQL(0.29)
ethyl benzene	100-41-4	µg/L	0.17	0.5	17.5	ND	ND
m+p xylene	108-38-3	µg/L	0.25	1.0	30.1	ND	ND
o-xylene	95-47-6	µg/L	0.16	0.5	21.9	<MDL	<MDL
1,3,5-Trimethylbenzene	108-67-8	µg/L	0.15	0.5	36.2	BQL(0.15)	BQL(0.14)
1,2,4-Trimethylbenzene	95-63-6	µg/L	0.10	0.5	142	1.90	1.76
1,2,3-Trimethylbenzene	526-73-8	µg/L	0.06	0.5	36.9	BQL(0.14)	BQL(0.14)
naphthalene	91-20-3	µg/L	0.12	0.5	2.18	0.58	0.63
p-bromofluorobenzene surrogate % rec.	460-00-4	µg/L	-	-	92%	94%	92%
dichlorobenzene_d4 surrogate % rec.	-	µg/L	-	-	102%	93%	92%
dilution factor	-	-	-	-	1, 51* & 401**	1.0	1.0

Comments:

The data quality objective (DQO) for the precision of a laboratory duplicate is a relative percent difference (RPD) of ≤25. The DQO was met for all compounds detected above the quantitation limit. All samples were scanned for the following compounds : ethanol, isopropanol, tert-butyl alcohol, methyl tert-butyl ether, di-isopropyl ether, n-propanol, ethyl tert-butyl ether, benzene, tert-amyl methyl ether, n-butanol, toluene, ethyl benzene, m+p xylene, o-xylene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, 1,2,3-trimethyl benzene and naphthalene. Values for scanned compounds are estimates only, therefore rpd's were not calculated.

Notes:

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Shaw Environmental, Inc.

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30A814HW

Method:

RSKSOP 259

Analysts:

Tracy Pardue

		Lab Sample ID			3449-04	3449-05	3449-06
		GCMS Tracking ID			ML7-3A	ML7-5A	ML7-7A
		Date Collected			6/29/2006	6/29/2006	6/29/2006
		Date Analyzed			8/19/06, 8/22/06*, 8/23/06**	8/19/06, 8/22/06*	8/22/2006
		Field Sample ID			ML7-3	ML7-5	ML7-7
Analytes	CAS #	Unit	MDL*	QL*	Data	Data	Data
vinyl chloride	75-01-4	ug/L	0.49	0.5	4490*	24.7	33.6
1,1-dichloroethene	75-34-4	ug/L	0.15	0.5	110	4.69	BQL(0.34)
carbon disulfide	75-15-0	ug/L	-	0.5	BQL(0.48)	BQL(0.18)	ND
methylene chloride	75-09-2	ug/L	-	0.5	BQL(0.19)	ND	BQL(0.18)
trans-1,2-dichloroethene	156-60-5	ug/L	0.10	0.5	2440*	15.9	11.9
1,1-dichloroethane	75-34-3	ug/L	0.05	0.5	67.4	5.68	0.61
cis-1,2-dichloroethene	156-59-2	ug/L	0.06	0.5	86900**	566	400
chloroform	67-66-3	ug/L	0.09	0.5	0.88	1.26	7.64
1,1,1-trichloroethane	71-55-6	ug/L	0.13	0.5	ND	ND	ND
carbon tetrachloride	56-23-5	ug/L	0.15	0.5	ND	ND	ND
1,2-dichloroethane	107-06-2	ug/L	0.13	0.5	0.96	ND	ND
trichloroethene	79-01-6	ug/L	0.07	0.5	3150*	5280*	39.8
1,1,2-trichloroethane	95-00-5	ug/L	-	0.5	ND	ND	ND
tetrachloroethene	127-18-4	ug/L	0.17	0.5	2200*	40100*	45.1
chlorobenzene	108-90-7	ug/L	0.18	0.5	BQL(0.23)	ND	ND
1,3-dichlorobenzene	541-73-1	ug/L	0.15	0.5	ND	ND	ND
1,4-dichlorobenzene	106-46-7	ug/L	0.13	0.5	ND	ND	ND
1,2-dichlorobenzene	95-50-1	ug/L	0.09	0.5	ND	1.44	ND
ethanol	64-17-5	µg/L	9.6	50	ND	ND	87.0
isopropanol	67-63-0	µg/L	1.5	10	BQL(3.5)	BQL(2.6)	BQL(7.0)
tert-butyl alcohol	75-65-0	µg/L	1.41	5.0	826	BQL(4.3)	7.52
methyl tert-butyl ether	1634-04-4	µg/L	0.11	0.5	ND	<MDL	ND
di-isopropyl ether	108-20-3	µg/L	0.21	0.5	ND	ND	ND
n-propanol	71-23-8	µg/L	-	50.0	ND	ND	ND
ethyl tert-butyl ether	637-92-3	µg/L	0.17	0.5	ND	ND	ND
benzene	71-43-2	µg/L	0.18	0.5	1.75	<MDL	ND
tert-amyl methyl ether	994-05-8	µg/L	0.11	0.5	ND	ND	ND
n-butanol	71-36-3	µg/L	-	50.0	ND	BQL(19)	ND
toluene	108-88-3	µg/L	0.17	0.5	62.8	4.61	<MDL
ethyl benzene	100-41-4	µg/L	0.17	0.5	39.3	3.26	ND
m+p xylene	108-38-3	µg/L	0.25	1.0	20.0	4.66	ND
o-xylene	95-47-6	µg/L	0.16	0.5	12.6	<MDL	ND
1,3,5-Trimethylbenzene	108-67-8	µg/L	0.15	0.5	6.81	12.3	ND
1,2,4-Trimethylbenzene	95-63-6	µg/L	0.10	0.5	72.1	24.6	0.60
1,2,3-Trimethylbenzene	526-73-8	µg/L	0.06	0.5	13.2	7.79	ND
naphthalene	91-20-3	µg/L	0.12	0.5	15.3	5.01	0.79
p-bromofluorobenzene surrogate % rec.	460-00-4	µg/L	-	-	86%	91%	95%
dichlorobenzene_d4 surrogate % rec.	-	µg/L	-	-	80%	95%	95%
dilution factor	-	-	-	-	1, 51* & 401**	1 & 51*	1.0

Comments:

The data quality objective (DQO) for the precision of a laboratory duplicate is a relative percent difference (RPD) of ≤25. The DQO was met for all compounds detected above the quantitation limit. All samples were scanned for the following compounds : ethanol, isopropanol, tert-butyl alcohol, methyl tert-butyl ether, di-isopropyl ether, n-propanol, ethyl tert-butyl ether, benzene, tert-amyl methyl ether, n-butanol, toluene, ethyl benzene, m+p xylene, o-xylene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, 1,2,3-trimethyl benzene and naphthalene. Values for scanned compounds are estimates only, therefore rpd's were not calculated.

Notes:

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Shaw Environmental, Inc.

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Method:

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Analysts:

Tracy Pardue

		Lab Sample ID			3449-07	3449-08	3449-09
		GCMS Tracking ID			ML7-2A	ML5-2A	ML3-2A
		Date Collected			6/29/2006	6/29/2006	6/29/2006
		Date Analyzed			8/19/06, 8/22/06*	8/19/06, 8/22/06*	8/20/06, 8/22/06*
		Field Sample ID			ML7-2	ML5-2	ML3-2
Analytes	CAS #	Unit	MDL*	QL*	Data	Data	Data
vinyl chloride	75-01-4	ug/L	0.49	0.5	2710*	412	3050*
1,1-dichloroethene	75-34-4	ug/L	0.15	0.5	37.7	12.9	3.94
carbon disulfide	75-15-0	ug/L	-	0.5	1.27	BQL(0.29)	BQL(0.12)
methylene chloride	75-09-2	ug/L	-	0.5	BQL(0.14)	0.88	ND
trans-1,2-dichloroethene	156-60-5	ug/L	0.10	0.5	973	483	280
1,1-dichloroethane	75-34-3	ug/L	0.05	0.5	34.5	12.8	10.8
cis-1,2-dichloroethene	156-59-2	ug/L	0.06	0.5	33900*	21800*	4160*
chloroform	67-66-3	ug/L	0.09	0.5	1.28	2.64	BQL(0.48)
1,1,1-trichloroethane	71-55-6	ug/L	0.13	0.5	ND	ND	ND
carbon tetrachloride	56-23-5	ug/L	0.15	0.5	ND	ND	ND
1,2-dichloroethane	107-06-2	ug/L	0.13	0.5	BQL(0.31)	<MDL	ND
trichloroethene	79-01-6	ug/L	0.07	0.5	4630*	5330*	104
1,1,2-trichloroethane	95-00-5	ug/L	-	0.5	ND	ND	ND
tetrachloroethene	127-18-4	ug/L	0.17	0.5	4050*	2220*	98.9
chlorobenzene	108-90-7	ug/L	0.18	0.5	ND	ND	ND
1,3-dichlorobenzene	541-73-1	ug/L	0.15	0.5	ND	ND	ND
1,4-dichlorobenzene	106-46-7	ug/L	0.13	0.5	ND	ND	ND
1,2-dichlorobenzene	95-50-1	ug/L	0.09	0.5	BQL(0.40)	1.01	BQL(0.47)
ethanol	64-17-5	µg/L	9.6	50	BQL(46)	BQL(36)	BQL(45)
isopropanol	67-63-0	µg/L	1.5	10	20.3	12.0	BQL(9.0)
tert-butyl alcohol	75-65-0	µg/L	1.41	5.0	409	70.0	25.0
methyl tert-butyl ether	1634-04-4	µg/L	0.11	0.5	ND	ND	ND
di-isopropyl ether	108-20-3	µg/L	0.21	0.5	ND	ND	ND
n-propanol	71-23-8	µg/L	-	50.0	ND	ND	ND
ethyl tert-butyl ether	637-92-3	µg/L	0.17	0.5	ND	ND	ND
benzene	71-43-2	µg/L	0.18	0.5	0.75	1.25	1.17
tert-amyl methyl ether	994-05-8	µg/L	0.11	0.5	ND	BQL(0.49)	BQL(0.42)
n-butanol	71-36-3	µg/L	-	50.0	ND	ND	ND
toluene	108-88-3	µg/L	0.17	0.5	18.2	12.6	14.4
ethyl benzene	100-41-4	µg/L	0.17	0.5	20.6	3.28	1.28
m+p xylene	108-38-3	µg/L	0.25	1.0	6.13	6.27	4.65
o-xylene	95-47-6	µg/L	0.16	0.5	4.41	6.72	5.26
1,3,5-Trimethylbenzene	108-67-8	µg/L	0.15	0.5	3.28	10.4	4.29
1,2,4-Trimethylbenzene	95-63-6	µg/L	0.10	0.5	26.4	34.3	13.8
1,2,3-Trimethylbenzene	526-73-8	µg/L	0.06	0.5	3.89	8.74	5.87
naphthalene	91-20-3	µg/L	0.12	0.5	16.1	2.92	ND
p-bromofluorobenzene surrogate % rec.	460-00-4	µg/L	-	-	92%	90%	91%
dichlorobenzene_d4 surrogate % rec.	-	µg/L	-	-	95%	90%	91%
dilution factor	-	-	-	-	1 & 51*	1 & 51*	1 & 10*

Comments:

The data quality objective (DQO) for the precision of a laboratory duplicate is a relative percent difference (RPD) of ≤25. The DQO was met for all compounds detected above the quantitation limit. All samples were scanned for the following compounds : ethanol, isopropanol, tert-butyl alcohol, methyl tert-butyl ether, di-isopropyl ether, n-propanol, ethyl tert-butyl ether, benzene, tert-amyl methyl ether, n-butanol, toluene, ethyl benzene, m+p xylene, o-xylene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, 1,2,3-trimethyl benzene and naphthalene. Values for scanned compounds are estimates only, therefore rpd's were not calculated.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable.

2. "-" denotes that the information is not available for the analyte as it was not analyzed.

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Shaw Environmental, Inc.

Analytical Technical Directive Results Report

Analytical Results

Laboratory:

Headspace GC/MS

Report Date:

8/23/06

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Technical Directive:

30A814HW

Method:

RSKSOP 259

Analysts:

Tracy Pardue

		Lab Sample ID			3456-01	3456-02
		GCMS Tracking ID			ML1-2A	ML2-2A
		Date Collected			6/29/2006	6/29/2006
		Date Analyzed			8/20/06, 8/22/06*	8/20/06, 8/22/06*
		Field Sample ID			ML1-2	ML2-2
Analytes	CAS #	Unit	MDL*	QL*	Data	Data
vinyl chloride	75-01-4	ug/L	0.49	0.5	899	512
1,1-dichloroethene	75-34-4	ug/L	0.15	0.5	4.00	33.4
carbon disulfide	75-15-0	ug/L	-	0.5	BQL(0.32)	1.66
methylene chloride	75-09-2	ug/L	-	0.5	ND	BQL(0.47)
trans-1,2-dichloroethene	156-60-5	ug/L	0.10	0.5	188	245
1,1-dichloroethane	75-34-3	ug/L	0.05	0.5	3.19	12.7
cis-1,2-dichloroethene	156-59-2	ug/L	0.06	0.5	6780*	37300*
chloroform	67-66-3	ug/L	0.09	0.5	0.93	0.55
1,1,1-trichloroethane	71-55-6	ug/L	0.13	0.5	ND	BQL(0.18)
carbon tetrachloride	56-23-5	ug/L	0.15	0.5	ND	ND
1,2-dichloroethane	107-06-2	ug/L	0.13	0.5	ND	ND
trichloroethene	79-01-6	ug/L	0.07	0.5	128	5760*
1,1,2-trichloroethane	95-00-5	ug/L	-	0.5	ND	ND
tetrachloroethene	127-18-4	ug/L	0.17	0.5	70.0	26300*
chlorobenzene	108-90-7	ug/L	0.18	0.5	ND	ND
1,3-dichlorobenzene	541-73-1	ug/L	0.15	0.5	ND	ND
1,4-dichlorobenzene	106-46-7	ug/L	0.13	0.5	ND	<MDL
1,2-dichlorobenzene	95-50-1	ug/L	0.09	0.5	ND	2.08
ethanol	64-17-5	µg/L	9.6	50	BQL(42)	BQL(46)
isopropanol	67-63-0	µg/L	1.5	10	BQL(6.6)	16.3
tert-butyl alcohol	75-65-0	µg/L	1.41	5.0	27.7	38.9
methyl tert-butyl ether	1634-04-4	µg/L	0.11	0.5	0.69	0.78
di-isopropyl ether	108-20-3	µg/L	0.21	0.5	ND	ND
n-propanol	71-23-8	µg/L	-	50.0	ND	ND
ethyl tert-butyl ether	637-92-3	µg/L	0.17	0.5	ND	ND
benzene	71-43-2	µg/L	0.18	0.5	1.20	0.91
tert-amyl methyl ether	994-05-8	µg/L	0.11	0.5	BQL(0.41)	BQL(0.44)
n-butanol	71-36-3	µg/L	-	50.0	ND	ND
toluene	108-88-3	µg/L	0.17	0.5	2.38	5.64
ethyl benzene	100-41-4	µg/L	0.17	0.5	1.22	2.18
m+p xylene	108-38-3	µg/L	0.25	1.0	BQL(0.65)	5.75
o-xylene	95-47-6	µg/L	0.16	0.5	1.29	4.18
1,3,5-Trimethylbenzene	108-67-8	µg/L	0.15	0.5	1.60	17.2
1,2,4-Trimethylbenzene	95-63-6	µg/L	0.10	0.5	7.84	52.9
1,2,3-Trimethylbenzene	526-73-8	µg/L	0.06	0.5	2.15	15.5
naphthalene	91-20-3	µg/L	0.12	0.5	0.94	6.13
p-bromofluorobenzene surrogate % rec.	460-00-4	µg/L	-	-	91%	89%
dichlorobenzene_d4 surrogate % rec.	-	µg/L	-	-	90%	91%
dilution factor	-	-	-	-	1 & 51*	1 & 51*

Comments:

The data quality objective (DQO) for the precision of a laboratory duplicate is a relative percent difference (RPD) of ≤25. The DQO was met for all compounds detected above the quantitation limit. All samples were scanned for the following compounds : ethanol, isopropanol, tert-butyl alcohol, methyl tert-butyl ether, di-isopropyl ether, n-propanol, ethyl tert-butyl ether, benzene, tert-amyl methyl ether, n-butanol, toluene, ethyl benzene, m+p xylene, o-xylene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, 1,2,3-trimethyl benzene and naphthalene. Values for scanned compounds are estimates only, therefore rpd's were not calculated.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable.

2. "-" denotes that the information is not available for the analyte 3456-01 and 3456-02.

SHAW ENVIRONMENTAL, Inc.
Analytical Service Results Report

Laboratory: **GC** Report Date: **10-Jul-2006**

Technical Directive: **30A815HW**

Sample Results (1,2)

Analyst:	Lisa Hudson		Analytes		Methane		Ethylene		Ethane		Acetylene		Carbon Dioxide		Propane		Butane			
			Codes		74-82-8		74-85-1		74-84-0		74-86-2		124-38-9		74-98-6		106-97-8			
			Unit		mg/L, in water		mg/L, in water		mg/L, in water		mg/L, in water		mg/L, in water		mg/L, in water		mg/L, in water			
			MDL		0.0002		0.0002		0.0001		0.0025		0.0203		0.0001		0.0002			
			QL		0.0010		0.0026		0.0019		0.0122		0.1740		0.0027		0.0034			
			Method:		RSKSOP-194 & RSKSOP-175															
			Lab Sample ID	Date Collected	Date Analyzed	Field Sample ID	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF		
			3446-1	26-Jun-2006	5-Jul-2006	Field Blank	ND	1	ND	1	ND	1	ND	1	0.931	1	ND	1	ND	1
			3446-2	26-Jun-2006	5-Jul-2006	PMW-1	0.582	1	0.191	1	ND	1	ND	1	604	10	ND	1	ND	1
			3446-3	26-Jun-2006	5-Jul-2006	PMW-2	0.783	1	0.183	1	ND	1	ND	1	293	2	ND	1	ND	1
			3446-4	26-Jun-2006	5-Jul-2006	PMW-6	0.653	1	0.504	1	ND	1	ND	1	203	2	ND	1	ND	1
			3446-5	26-Jun-2006	5-Jul-2006	PMW-3	0.606	1	0.125	1	ND	1	ND	1	913	10	ND	1	ND	1
			3446-6	26-Jun-2006	5-Jul-2006	PMW-4	0.246	1	ND	1	ND	1	ND	1	280	2	ND	1	ND	1
			3446-7	27-Jun-2006	5-Jul-2006	PMW-5	0.163	1	0.0099	1	ND	1	ND	1	806	10	ND	1	ND	1
			3446-8	27-Jun-2006	5-Jul-2006	ML1-3	0.306	1	0.0864	1	ND	1	ND	1	168	1	ND	1	ND	1
			3446-9	27-Jun-2006	5-Jul-2006	ML1-5	0.348	1	0.101	1	ND	1	ND	1	95.1	1	ND	1	ND	1
			3446-10	27-Jun-2006	5-Jul-2006	ML1-7	0.159	1	ND	1	ND	1	ND	1	16.3	1	ND	1	ND	1
			3446-10 Lab Dup	27-Jun-2006	5-Jul-2006	ML1-7	0.159 (RPD=0)	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1	16.3 (RPD=0)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
			3446-11	27-Jun-2006	5-Jul-2006	ML2-3	0.344	1	0.0426	1	ND	1	ND	1	121	1	ND	1	ND	1
			3446-12	27-Jun-2006	5-Jul-2006	ML2-5	0.122	1	0.0045	1	ND	1	ND	1	889	10	ND	1	ND	1
			3446-13	27-Jun-2006	5-Jul-2006	ML2-7	0.0840	1	0.0342	1	ND	1	ND	1	145	1	ND	1	ND	1
			3446-14	27-Jun-2006	5-Jul-2006	ML3-3	2.67	1	1.90	1	ND	1	ND	1	247	2	ND	1	ND	1
			3446-15	27-Jun-2006	5-Jul-2006	ML3-5	0.165	1	0.0148	1	ND	1	ND	1	863	10	ND	1	ND	1
			3446-16	27-Jun-2006	5-Jul-2006	ML3-7	0.769	1	0.0030	1	ND	1	ND	1	179	1	ND	1	ND	1
			3446-17	27-Jun-2006	5-Jul-2006	ML3-7 duplicate	0.805	1	ND	1	ND	1	ND	1	175	1	ND	1	ND	1
			3446-18	28-Jun-2006	5-Jul-2006	ML4-3	1.74	1	0.712	1	ND	1	ND	1	251	2	ND	1	ND	1
			3446-19	28-Jun-2006	5-Jul-2006	ML4-5	0.276	1	0.0451	1	ND	1	ND	1	212	2	ND	1	ND	1
			3446-20	28-Jun-2006	5-Jul-2006	ML4-7	0.463	1	ND	1	ND	1	ND	1	186	1	ND	1	ND	1
			3446-20 Lab Dup	28-Jun-2006	5-Jul-2006	ML4-7	0.461 (RPD=0.43)	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1	173 (RPD=7.24)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
			3446-21	28-Jun-2006	5-Jul-2006	ML5-3	0.922	1	0.260	1	0.0080	1	ND	1	290	2	ND	1	ND	1
			3446-22	28-Jun-2006	5-Jul-2006	ML5-5	0.233	1	0.0258	1	ND	1	ND	1	774	10	ND	1	ND	1
			3446-23	28-Jun-2006	5-Jul-2006	ML5-7	0.208	1	0.0055	1	ND	1	ND	1	383	10	ND	1	ND	1
			3446-23 Lab Dup	28-Jun-2006	5-Jul-2006	ML5-7	0.209 (RPD=0.48)	1	0.0053 (RPD=3.70)	1	ND (RPD=NA)	1	ND (RPD=NA)	1	382 (RPD=0.26)	10	ND (RPD=NA)	1	ND (RPD=NA)	1

Comments:

The data quality objective (DQO) for the precision of laboratory duplicate samples is a relative percent difference (RPD) of ≤ 20 as specified in the SOP. RPDs were met for the duplicate samples in this sample set.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

SHAW ENVIRONMENTAL, Inc.
Analytical Service Results Report

Laboratory: **GC** Report Date: **10-Jul-2006**

Technical Directive: **30A815HW**

Sample Results (1,2)

Analyst:	Lisa Hudson		Analytes		Methane		Ethylene		Ethane		Acetylene		Carbon Dioxide		Propane		Butane	
			Codes		74-82-8		74-85-1		74-84-0		74-86-2		124-38-9		74-98-6		106-97-8	
			Unit		mg/L, in water		mg/L, in water		mg/L, in water		mg/L, in water		mg/L, in water		mg/L, in water		mg/L, in water	
			MDL		0.0002		0.0002		0.0001		0.0025		0.0204		0.0001		0.0002	
			QL		0.0010		0.0026		0.0019		0.0122		0.1740		0.0027		0.0034	
Method:	RSKSOP-194 & RSKSOP-175		Lab Sample ID	Date Collected	Date Analyzed	Field Sample ID	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
			3448-1	28-Jun-2006	6-Jul-2006	ML 6-3	1.10	1	0.214	1	0.0108	1	ND	1	144	1	ND	1
			3448-2	28-Jun-2006	6-Jul-2006	ML 6-5	1.01	1	0.325	1	0.0129	1	ND	1	234	2	BQL (0.0003)	1
			3448-3	28-Jun-2006	6-Jul-2006	ML 6-7	0.342	1	BQL (0.0023)	1	ND	1	ND	1	104	1	ND	1
			3448-4	29-Jun-2006	6-Jul-2006	ML 7-3	1.22	1	0.0958	1	0.0028	1	ND	1	390	2	BQL (0.0003)	1
			3448-5	29-Jun-2006	6-Jul-2006	ML 7-5	0.0932	1	0.0031	1	ND	1	ND	1	683	10	ND	1
			3448-6	29-Jun-2006	6-Jul-2006	ML 7-7	0.206	1	ND	1	ND	1	ND	1	341	10	ND	1
			3448-7	29-Jun-2006	6-Jul-2006	ML 7-2	0.168	1	0.027	1	ND	1	ND	1	89.5	1	ND	1
			3448-8	29-Jun-2006	6-Jul-2006	ML 5-2	0.249	1	0.0377	1	ND	1	ND	1	270	2	ND	1
			3448-9	29-Jun-2006	6-Jul-2006	ML 3-2	1.29	1	0.892	1	ND	1	ND	1	193	2	ND	1
			3455-1	29-Jun-2006	6-Jul-2006	ML 1-2	0.760	1	1.31	1	ND	1	ND	1	172	1	ND	1
			3455-2	29-Jun-2006	6-Jul-2006	ML 2-2	0.200	1	0.0710	1	ND	1	ND	1	131	1	ND	1
			3455-2 Lab Dup	29-Jun-2006	6-Jul-2006	ML 2-2	0.186 (RPD=7.25)	1	0.0665 (RPD=6.55)	1	ND (RPD=NA)	1	ND (RPD=NA)	1	116 (RPD=12.1)	1	ND (RPD=NA)	1

Comments:

The data quality objective (DQO) for the precision of laboratory duplicate samples is a relative percent difference (RPD) of ≤ 20 as specified in the SOP. RPDs were met for the duplicate samples in this sample set.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable.
2. " - " denotes that the information is not available or the analyte is not analyzed.

SHAW ENVIRONMENTAL, Inc.
Analytical Service Results Report

Laboratory: **GC** Report Date: **10-Jul-2006**

Technical Directive: **30A815HW**

Sample Results (1,2)

Analyst:	Lisa Hudson		Analytes		Methane		Ethylene		Ethane		Acetylene		Carbon Dioxide		Propane		Butane	
			Codes		74-82-8		74-85-1		74-84-0		74-86-2		124-38-9		74-98-6		106-97-8	
			Unit		mg/L, in water		mg/L, in water		mg/L, in water		mg/L, in water		mg/L, in water		mg/L, in water		mg/L, in water	
			MDL		0.0002		0.0002		0.0001		0.0025		0.0204		0.0001		0.0002	
			QL		0.0010		0.0026		0.0019		0.0122		0.1740		0.0027		0.0034	
Method:	RSKSOP-194 & RSKSOP-175		Lab Sample ID	Date Collected	Date Analyzed	Field Sample ID	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
			3448-1	28-Jun-2006	6-Jul-2006	ML 6-3	1.10	1	0.214	1	0.0108	1	ND	1	144	1	ND	1
			3448-2	28-Jun-2006	6-Jul-2006	ML 6-5	1.01	1	0.325	1	0.0129	1	ND	1	234	2	BQL (0.0003)	1
			3448-3	28-Jun-2006	6-Jul-2006	ML 6-7	0.342	1	BQL (0.0023)	1	ND	1	ND	1	104	1	ND	1
			3448-4	29-Jun-2006	6-Jul-2006	ML 7-3	1.22	1	0.0958	1	0.0028	1	ND	1	390	2	BQL (0.0003)	1
			3448-5	29-Jun-2006	6-Jul-2006	ML 7-5	0.0932	1	0.0031	1	ND	1	ND	1	683	10	ND	1
			3448-6	29-Jun-2006	6-Jul-2006	ML 7-7	0.206	1	ND	1	ND	1	ND	1	341	10	ND	1
			3448-7	29-Jun-2006	6-Jul-2006	ML 7-2	0.168	1	0.027	1	ND	1	ND	1	89.5	1	ND	1
			3448-8	29-Jun-2006	6-Jul-2006	ML 5-2	0.249	1	0.0377	1	ND	1	ND	1	270	2	ND	1
			3448-9	29-Jun-2006	6-Jul-2006	ML 3-2	1.29	1	0.892	1	ND	1	ND	1	193	2	ND	1
			3455-1	29-Jun-2006	6-Jul-2006	ML 1-2	0.760	1	1.31	1	ND	1	ND	1	172	1	ND	1
			3455-2	29-Jun-2006	6-Jul-2006	ML 2-2	0.200	1	0.0710	1	ND	1	ND	1	131	1	ND	1
			3455-2 Lab Dup	29-Jun-2006	6-Jul-2006	ML 2-2	0.186 (RPD=7.25)	1	0.0665 (RPD=6.55)	1	ND (RPD=NA)	1	ND (RPD=NA)	1	116 (RPD=12.1)	1	ND (RPD=NA)	1

Comments:

The data quality objective (DQO) for the precision of laboratory duplicate samples is a relative percent difference (RPD) of ≤ 20 as specified in the SOP. RPDs were met for the duplicate samples in this sample set.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable.
2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

08/30/06

Technical Directive:

3GP906HW

Analyst:

Kristie Hargrove

Analytes	Total Inorganic Carbon (TIC)	Total Organic Carbon (TOC)		
Codes	7440-44-0-TIC	7440-44-0-TOC		
Methods	RSKSOP-265 Rev. 1	RSKSOP-265 Rev. 1		
Unit	mg/L	mg/L		
MDL	0.473	0.020		
QL	20.0	20.0		

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF
Field Blank	3519-1	8/21/2006	8/28-8/30/06	BQL (0.594)	1	BQL (0.108)	1				
PMW3	3519-2	8/21/2006	8/28-8/30/06	66.3	1	24.4	1				
PMW-5	3519-3	8/21/2006	8/28-8/30/06	63.7	1	BQL (17.8)	1				
PMW-5 DUP	3519-4	8/21/2006	-	NSF	-	NSF	-				
PMW-6	3519-5	8/21/2006	8/28-8/30/06	63.1	1	BQL (13.1)	1				
ML1-4	3519-6	8/21/2006	8/28-8/30/06	115	1	34.9	1				
ML1-6	3519-7	8/21/2006	8/28-8/30/06	51.7	1	BQL (19.7)	1				
ML2-4	3519-8	8/21/2006	8/28-8/30/06	108	1	42.3	1				
ML2-6	3519-9	8/21/2006	8/28-8/30/06	76.6	1	21.6	1				
ML3-4	3519-10	8/22/2006	8/28-8/30/06	90.6	1	BQL (16.9)	1				
ML3-6	3519-11	8/22/2006	8/28-8/30/06	91.0	1	BQL (13.3)	1				
ML4-2	3519-12	8/22/2006	8/28-8/30/06	128	1	52.9	1				
ML3-2	3519-13	8/22/2006	8/28-8/30/06	103	1	42.3	1				
ML3-3	3519-14	8/22/2006	8/28-8/30/06	126	1	50.0	1				
ML3-5	3519-15	8/22/2006	8/28-8/30/06	72.0	1	BQL (8.81)	1				
ML2-2	3519-16	8/22/2006	8/28-8/30/06	97.6	1	51.9	1				
ML2-3	3519-17	8/22/2006	8/28-8/30/06	97.5	1	87.1	1				
ML2-5	3519-18	8/22/2006	8/28-8/30/06	88.1	1	27.7	1				
ML5-2	3519-19	8/23/2006	8/28-8/30/06	115	1	71.5	1				
ML5-3	3519-20	8/23/2006	8/28-8/30/06	113	1	44.9	1				
ML5-4	3519-21	8/23/2006	8/28-8/30/06	109	1	30.7	1				
ML5-5	3519-22	8/23/2006	8/28-8/30/06	136	1	31.3	1				
ML5-6	3519-23	8/23/2006	8/28-8/30/06	95.5	1	27.0	1				
ML5-6	3519-23 LAB DUP	8/23/2006	8/28-8/30/06	95.2 (RPD=0.315)	1	26.8 (RPD=0.743)	1				
ML5-7	3519-24	8/23/2006	8/28-8/30/06	113	1	26.3	1				
ML7-2	3519-25	8/23/2006	8/28-8/30/06	141	1	75.4	1				
ML7-3	3519-26	8/23/2006	8/28-8/30/06	168	1	84.4	1				
ML7-4	3519-27	8/23/2006	8/28-8/30/06	136	1	51.3	1				
ML7-5	3519-28	8/23/2006	8/28-8/30/06	112	1	33.0	1				
ML7-6	3519-29	8/24/2006	8/28-8/30/06	168	1	52.5	1				

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

08/30/06

Technical Directive:

3GP906HW

Analyst:

Kristie Hargrove

Analytes	Total Inorganic Carbon (TIC)	Total Organic Carbon (TOC)		
Codes	7440-44-0-TIC	7440-44-0-TOC		
Methods	RSKSOP-265 Rev. 1	RSKSOP-265 Rev. 1		
Unit	mg/L	mg/L		
MDL	0.473	0.020		
QL	20.0	20.0		

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF
ML7-7	3519-30	8/24/2006	8/28-8/30/06	138	1	55.2	1				
ML6-2	3519-31	8/24/2006	8/28-8/30/06	103	1	82.5	1				
ML6-4	3519-32	8/24/2006	8/28-8/30/06	129	1	51.4	1				
ML6-6	3519-33	8/24/2006	8/28-8/30/06	78.9	1	21.1	1				
ML2-2	3519-34	8/24/2006	8/28-8/30/06	126	1	53.5	1				
ML4-4	3519-35	8/24/2006	8/28-8/30/06	123	1	38.1	1				
ML4-6	3519-36	8/24/2006	8/28-8/30/06	99.3	1	22.7	1				
FLD BLANK	3519-37	8/24/2006	8/28-8/30/06	BQL (0.349)	1	BQL (0.227)	1				
ML5-6 DUP	3519-38	8/23/2006	8/28-8/30/06	95.3	1	26.6	1				

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set. Field sample PMW-5 Dup was used to prepare the matrix spike.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (**DF**), if applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **General Parameters** Report Date: **09/07/06**

Technical Directive: **3GP906HW**

Analyst: **Vanessa Scroggins**

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Analytes		Chloride (Cl)		Bromide (Br)		Nitrite-N (NO ₂ -N)		Sulfate (as SO ₄)		Nitrate-N (NO ₃ -N)		Fluoride (F)	
				Codes		16887-00-6		7726-95-6-BR		14797-65-0		14808-79-8		14797-55-8		7782-41-4	
				Methods		RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288	
				Unit		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
				MDL		0.263		0.080		0.098		0.298		0.066		0.095	
				QL		1.00		1.00		0.200		1.00		0.200		0.500	
				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Field Blank	3519-1	8/21/2006	8/28,29,31/06&9/5/06	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
PMW-3	3519-2	8/21/2006	8/28,29,31/06&9/5/06	80.0	6	BQL (0.361)	1	ND	1	55.7	6	ND	1	BQL (0.167)	1		
PMW-5	3519-3	8/21/2006	8/28,29,31/06&9/5/06	73.3	6	BQL (0.770)	1	ND	1	33.5	1	ND	1	BQL (0.220)	1		
PMW-5 duplicate	3519-4	8/21/2006	8/28,29,31/06&9/5/06	73.4	6	BQL (0.562)	1	ND	1	33.3	1	ND	1	BQL (0.157)	1		
PMW-6	3519-5	8/21/2006	8/28,29,31/06&9/5/06	47.1	1	1.04	1	ND	1	44.9	1	ND	1	BQL (0.270)	1		
ML1-4	3519-6	8/21/2006	8/28,29,31/06&9/5/06	46.9	1	BQL (0.797)	1	ND	1	295	6	ND	1	BQL (0.329)	1		
ML1-6	3519-7	8/21/2006	8/28,29,31/06&9/5/06	106	6	BQL (0.264)	1	ND	1	185	6	ND	1	BQL (0.228)	1		
ML2-4	3519-8	8/21/2006	8/28,29,31/06&9/5/06	82.7	11	BQL (0.281)	1	ND	1	362	11	ND	1	BQL (0.478)	1		
ML2-6	3519-9	8/21/2006	8/28,29,31/06&9/5/06	85.4	11	ND	1	ND	1	398	11	ND	1	ND	1		
ML3-4	3519-10	8/22/2006	8/28,29,31/06&9/5/06	49.0	1	1.03	1	ND	1	69.6	6	ND	1	BQL (0.351)	1		
ML3-4	3519-10 LAB DUP	8/22/2006	8/28,29,31/06&9/5/06	49.4 (RPD=0.813)	1	BQL (0.973) (RPD=NA)	1	ND (RPD=NA)	1	70.5 (RPD=1.28)	6	ND (RPD=NA)	1	BQL (0.352) (RPD=NA)	1		
ML3-6	3519-11	8/22/2006	8/28,29,31/06&9/5/06	54.1	2	BQL (0.914)	1	ND	1	55.6	2	ND	1	BQL (0.435)	1		
ML4-2	3519-12	8/22/2006	8/28,29,31/06&9/5/06	242	11	BQL (0.500)	1	ND	1	361	11	ND	1	BQL (0.230)	1		
ML3-2	3519-13	8/22/2006	8/28,29,31/06&9/5/06	225	6	BQL (0.739)	1	ND	1	102	6	ND	1	BQL (0.333)	1		
ML3-3	3519-14	8/22/2006	8/28,29,31/06&9/5/06	144	6	BQL (0.828)	1	ND	1	83.8	6	ND	1	BQL (0.551)	1		
ML3-5	3519-15	8/22/2006	8/28,29,31/06&9/5/06	32.6	1	ND	1	ND	1	50.1	2	ND	1	BQL (0.299)	1		
ML2-2	3519-16	8/22/2006	8/28,29,31/06&9/5/06	318	11	BQL (0.321)	1	ND	1	430	11	ND	1	ND	1		
ML2-3	3519-17	8/22/2006	8/28,29,31/06&9/5/06	146	11	ND	1	ND	1	886	21	ND	1	ND	1		
ML2-5	3519-18	8/22/2006	8/28,29,31/06&9/5/06	44.3	1	BQL (0.100)	1	ND	1	277	11	ND	1	BQL (0.452)	1		
ML5-2	3519-19	8/23/2006	8/28,29,31/06&9/5/06	221	11	BQL (0.388)	1	ND	1	410	11	ND	1	ND	1		
ML5-3	3519-20	8/23/2006	8/28,29,31/06&9/5/06	180	6	ND	1	ND	1	205	6	ND	1	BQL (0.228)	1		
ML5-4	3519-21	8/23/2006	8/28,29,31/06&9/5/06	58.8	6	1.17	1	ND	1	253	6	ND	1	BQL (0.136)	1		
ML5-4	3519-21 LAB DUP	8/23/2006	8/28,29,31/06&9/5/06	58.4 (RPD=0.683)	6	1.19 (RPD=1.69)	1	ND (RPD=NA)	1	253 (RPD=0)	6	ND (RPD=NA)	1	BQL (0.139) (RPD=NA)	1		
ML5-5	3519-22	8/23/2006	8/28,29,31/06&9/5/06	66.1	6	BQL (0.680)	1	ND	1	259	6	ND	1	BQL (0.361)	1		
ML5-6	3519-23	8/23/2006	8/28,29,31/06&9/5/06	91.4	11	ND	1	ND	1	285	11	ND	1	BQL (0.212)	1		
ML5-7	3519-24	8/23/2006	8/28,29,31/06&9/5/06	122	11	ND	1	ND	1	249	11	ND	1	BQL (0.397)	1		
ML7-2	3519-25	8/23/2006	8/28,29,31/06&9/5/06	265	11	BQL (0.465)	1	ND	1	470	11	ND	1	BQL (0.108)	1		
ML7-3	3519-26	8/23/2006	8/28,29,31/06&9/5/06	224	11	BQL (0.142)	1	ND	1	546	11	ND	1	BQL (0.375)	1		

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **General Parameters** Report Date: **09/07/06**

Technical Directive: **3GP906HW**

Analyst: **Vanessa Scroggins**

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Analytes		Chloride (Cl)		Bromide (Br)		Nitrite-N (NO ₂ -N)		Sulfate (as SO ₄)		Nitrate-N (NO ₃ -N)		Fluoride (F)	
				Codes		16887-00-6		7726-95-6-BR		14797-65-0		14808-79-8		14797-55-8		7782-41-4	
				Methods		RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288	
				Unit		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
				MDL		0.263		0.080		0.098		0.298		0.066		0.095	
				QL		1.00		1.00		0.200		1.00		0.200		0.500	
				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
ML7-4	3519-27	8/23/2006	8/28,29,31/06&9/5/06	103	11	BQL (0.831)	1	ND	1	447	11	ND	1	BQL (0.201)	1		
ML7-5	3519-28	8/23/2006	8/28,29,31/06&9/5/06	62.8	6	BQL (0.574)	1	ND	1	224	6	ND	1	BQL (0.319)	1		
ML7-6	3519-29	8/24/2006	8/28,29,31/06&9/5/06	81.6	11	BQL (0.145)	1	ND	1	438	11	ND	1	0.504	1		
ML7-7	3519-30	8/24/2006	8/28,29,31/06&9/5/06	104	11	ND	1	ND	1	762	21	ND	1	BQL (0.250)	1		
ML7-7	3519-30 LAB DUP	8/24/2006	8/28,29,31/06&9/5/06	102 (RPD=1.94)	11	ND (RPD=NA)	1	ND (RPD=NA)	1	762 (RPD=0)	21	ND (RPD=NA)	1	BQL (0.242) (RPD=NA)	1		
ML6-2	3519-31	8/24/2006	8/28,29,31/06&9/5/06	207	11	BQL (0.792)	1	ND	1	298	11	ND	1	ND	1		
ML6-4	3519-32	8/24/2006	8/28,29,31/06&9/5/06	39.3	1	ND	1	ND	1	441	11	ND	1	BQL (0.404)	1		
ML6-6	3519-33	8/24/2006	8/28,29,31/06&9/5/06	97.3	6	1.10	1	ND	1	160	6	ND	1	BQL (0.182)	1		
ML2-2	3519-34	8/24/2006	8/28,29,31/06&9/5/06	252	11	BQL (0.552)	1	ND	1	361	11	ND	1	ND	1		
ML4-4	3519-35	8/24/2006	8/28,29,31/06&9/5/06	68.6	6	BQL (0.935)	1	ND	1	144	6	ND	1	BQL (0.237)	1		
ML4-4	3519-35 LAB DUP	8/24/2006	8/28,29,31/06&9/5/06	68.1 (RPD=0.732)	6	BQL (0.937) (RPD=NA)	1	ND (RPD=NA)	1	144 (RPD=0)	6	ND (RPD=NA)	1	BQL (0.231) (RPD=NA)	1		
ML4-6	3519-36	8/24/2006	8/28,29,31/06&9/5/06	87.9	6	BQL (0.504)	1	ND	1	178	6	ND	1	BQL (0.185)	1		
FIELD BLK	3519-37	8/24/2006	8/28,29,31/06&9/5/06	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
ML5-6 DUP	3519-38	8/23/2006	8/28,29,31/06&9/5/06	93.4	6	BQL (0.365)	1	ND	1	293	6	ND	1	ND	1		

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set within the calibration range. *MDL and QL should be raised by the same factor as the dilution factor for those samples that were diluted.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (**DF**), if applicable.
2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

Report Date:

9/21/06

Page 1 of 8

Technical Directive:

3ME352HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analysts:	S. Markham/S. Saye		Field Sample ID		FIELD BLANK		PMW-3		PMW-3		PMW-5		PMW-5 DUPLICATE		PMW-6		
			Sample Lab ID		3519-01		3519-02		3519-02 Lab Dup.*		3519-03		3519-04		3519-05		
Method:	RSKSOP 213(2)		Date Collected		8/21/06		8/21/06		8/21/06		8/21/06		8/21/06		8/21/06		
			Date Analyzed		9/12/06		9/12/06		9/12/06		9/12/06		9/12/06		9/12/06		
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names		Codes															
Silver (Ag)		7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	BQL(0.004) (RDP=NA)	1	ND	1	ND	1	ND	1
Aluminum (Al)		7429-90-5	mg/L	0.040	0.133	ND	1	0.322	1	0.309 (RPD=4.12)	1	BQL(0.090)	1	BQL(0.075)	1	BQL(0.055)	1
Arsenic (As)		7440-38-2	mg/L	0.006	0.019	ND	1	0.073	1	0.075 (RPD=2.70)	1	0.043	1	0.045	1	0.053	1
Boron (B)		7440-42-8	mg/L	0.014	0.049	ND	1	0.161	1	0.161 (RPD=0.00)	1	0.145	1	0.144	1	0.127	1
Barium (Ba)		7440-39-3	mg/L	0.001	0.004	ND	1	0.075	1	0.075 (RPD=0.00)	1	0.056	1	0.055	1	0.042	1
Beryllium (Be)		7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Calcium (Ca)		7440-70-2	mg/L	0.027	0.089	ND	1	23.8	1	23.9 (RPD=0.42)	1	28.7	1	28.5	1	23.4	1
Cadmium (Cd)		7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Cobalt (Co)		7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Chromium (Cr)		7440-47-3	mg/L	0.001	0.004	ND	1	BQL(0.001)	1	BQL(0.001) (RPD=NA)	1	ND	1	ND	1	ND	1
Copper (Cu)		7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Iron (Fe)		7439-89-6	mg/L	0.006	0.019	BQL(0.006)	1	32.2	1	32.4 (RPD=0.62)	1	14.1	1	13.9	1	15.8	1
Potassium (K)		7440-09-7	mg/L	0.061	0.204	BQL(0.081)	1	1.16	1	1.23 (RPD=5.86)	1	3.02	1	3.00	1	1.16	1
Magnesium (Mg)		7439-95-4	mg/L	0.027	0.089	ND	1	13.2	1	13.1 (RPD=0.76)	1	8.31	1	8.20	1	8.70	1
Manganese (Mn)		7439-96-5	mg/L	0.001	0.004	ND	1	0.112	1	0.112 (RPD=0.00)	1	0.174	1	0.172	1	0.119	1
Molybdenum (Mo)		7439-98-7	mg/L	0.001	0.004	ND	1	BQL(0.004)	1	BQL(0.004) (RDP=NA)	1	0.005	1	BQL(0.004)	1	BQL(0.004)	1
Sodium (Na)		7440-23-5	mg/L	0.047	0.155	BQL(0.154)	1	59.2	1	59.1 (RPD=0.17)	1	55.5	1	54.6	1	49.4	1
Nickel (Ni)		7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	BQL(0.009)	1	ND	1	ND	1
Lead (Pb)		7439-92-1	mg/L	0.002	0.008	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Antimony (Sb)		7440-36-0	mg/L	0.003	0.011	ND	1	BQL(0.006)	1	BQL(0.004) (RDP=NA)	1	BQL(0.004)	1	BQL(0.006)	1	BQL(0.006)	1
Selenium (Se)		7782-49-2	mg/L	0.003	0.011	BQL(0.003)	1	BQL(0.009)	1	0.012 (RPD=NA)	1	0.016	1	BQL(0.007)	1	0.012	1
Strontium (Sr)		7440-24-6	mg/L	0.001	0.004	ND	1	0.156	1	0.156 (RPD=0.00)	1	0.149	1	0.146	1	0.129	1
Titanium (Ti)		7440-32-6	mg/L	0.001	0.004	ND	1	0.009	1	0.008 (RPD=11.76)	1	BQL(0.003)	1	BQL(0.002)	1	BQL(0.002)	1
Thallium (Tl)		7440-28-0	mg/L	0.006	0.019	ND	1	BQL(0.012)	1	BQL(0.012) (RPD=NA)	1	BQL(0.013)	1	BQL(0.010)	1	BQL(0.008)	1
Vanadium (V)		7440-62-2	mg/L	0.002	0.008	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Zinc (Zn)		7440-66-6	mg/L	0.007	0.022	ND	1	BQL(0.009)	1	BQL(0.013) (RPD=NA)	1	BQL(0.012)	1	BQL(0.007)	1	BQL(0.008)	1
Silicon (Si)		7440-21-3	mg/L	0.049	0.163	BQL(0.156)	1	12.8	1	12.9 (RPD=0.78)	1	14.9	1	15.0	1	13.8	1
Sulfur (S)		7704-34-9	mg/L	0.102	0.341	ND	1	17.3	1	17.3 (RPD=0.00)	1	10.8	1	11.4	1	13.9	1
Phosphorus (P)		7723-14-0	mg/L	0.012	0.041	ND	1	0.750	1	0.749 (RPD=0.13)	1	0.603	1	0.611	1	0.906	1
Uranium (U)		7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. * - * denotes that the information is not available or the analyte is not analyzed.

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RKSOP 213(2)

Field Sample ID		ML 1-4		ML 1-6		ML 1-6		ML 2-4		ML 2-6		ML 3-4				
Sample Lab ID		3519-06		3519-07		3519-07 Lab Dup.		3519-08		3519-09		3519-10				
Date Collected		8/21/06		8/21/06		8/21/06		8/21/06		8/21/06		8/22/06				
Date Analyzed		9/12/06		9/12/06		9/12/06		9/12/06		9/12/06		9/12/06				
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	3.23	1	2.18	1	2.20 (RPD=0.91)	1	3.43	1	0.164	1	10.9	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.021	1	BQL(0.015)	1	BQL(0.013) (RPD=NA)	1	0.050	1	BQL(0.013)	1	BQL(0.015)	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.206	1	0.113	1	0.110 (RPD=2.69)	1	0.204	1	0.178	1	0.152	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.067	1	0.063	1	0.064 (RPD=1.57)	1	0.050	1	0.056	1	0.061	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	41.4	1	40.6	1	40.8 (RPD=0.49)	1	54.3	1	46.5	1	27.1	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	BQL(0.001)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	BQL(0.004)	1	BQL(0.004)	1	BQL(0.004) (RPD=NA)	1	BQL(0.003)	1	ND	1	0.015	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	20.6	1	21.9	1	21.9 (RPD=0.00)	1	7.28	1	6.87	1	11.3	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.80	1	1.82	1	1.76 (RPD=3.35)	1	1.98	1	1.59	1	1.90	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	9.89	1	7.78	1	7.84 (RPD=0.77)	1	11.8	1	9.45	1	7.02	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.308	1	0.329	1	0.327 (RPD=0.61)	1	0.261	1	0.356	1	0.184	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.004)	1	BQL(0.004) (RPD=NA)	1	0.010	1	0.009	1	BQL(0.003)	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	249	1	147	1	148 (RPD=0.68)	1	259	1	261	1	112	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	BQL(0.004)	1	BQL(0.004) (RPD=NA)	1	ND	1	ND	1	BQL(0.004)	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.006)	1	BQL(0.006)	1	BQL(0.007) (RPD=NA)	1	BQL(0.006)	1	BQL(0.006)	1	ND	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	0.014	1	0.011	1	0.012 (RPD=8.70)	1	0.012	1	0.015	1	BQL(0.009)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.286	1	0.221	1	0.223 (RPD=0.90)	1	0.437	1	0.253	1	0.217	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.093	1	0.065	1	0.065 (RPD=0.00)	1	0.087	1	BQL(0.004)	1	0.300	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.018)	1	BQL(0.015)	1	BQL(0.015) (RPD=NA)	1	0.020	1	BQL(0.018)	1	BQL(0.012)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.005)	1	BQL(0.005)	1	BQL(0.005) (RPD=NA)	1	BQL(0.007)	1	ND	1	0.016	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	BQL(0.009)	1	BQL(0.012)	1	BQL(0.012) (RPD=NA)	1	BQL(0.010)	1	BQL(0.011)	1	BQL(0.017)	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	17.8	1	18.2	1	18.2 (RPD=0.00)	1	17.2	1	15.3	1	29.7	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	93.2	1	57.2	1	56.8 (RPD=0.70)	1	116	1	129	1	23.3	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.044	1	BQL(0.019)	1	BQL(0.021) (RPD=NA)	1	0.074	1	0.051	1	0.938	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

- Notes:
- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
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Analytical Service Results Report

Laboratory:

Metals

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Technical Directive:

3ME352HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML 3-6		ML 4-2		ML 4-2		ML 3-2		ML 3-2		ML 3-3	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	0.511	1	ND	1	ND (RPD=NA)	1	0.483	1	0.461 (RPD=4.66)	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	BQL(0.012)	1	0.026	1	0.024 (RPD=8.00)	1	0.033	1	0.032 (RPD=3.08)	1	0.106	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.140	1	0.363	1	0.361 (RPD=0.55)	1	0.122	1	0.120 (RPD=1.65)	1	0.114	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.035	1	0.150	1	0.150 (RPD=0.00)	1	0.111	1	0.110 (RPD=0.90)	1	0.070	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	44.9	1	65.2	1	65.2 (RPD=0.00)	1	44.0	1	43.8 (RPD=0.46)	1	42.4	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	4.69	1	41.4	1	41.9 (RPD=1.20)	1	35.3	1	35.2 (RPD=0.28)	1	28.1	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.44	1	7.36	1	7.33 (RPD=0.41)	1	4.47	1	4.48 (RPD=0.22)	1	2.29	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	5.31	1	22.1	1	22.2 (RPD=0.45)	1	26.0	1	25.9 (RPD=0.39)	1	21.6	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.215	1	0.451	1	0.453 (RPD=0.44)	1	0.358	1	0.357 (RPD=0.28)	1	0.282	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1	0.006	1	0.006 (RPD=0.00)	1	0.007	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	108	1	334	1	334 (RPD=0.00)	1	191	1	189 (RPD=1.05)	1	198	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.004)	1	BQL(0.009)	1	0.012 (RPD=NA)	1	BQL(0.006)	1	BQL(0.009) (RPD=NA)	1	BQL(0.007)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.009)	1	0.017	1	0.015 (RPD=12.50)	1	0.012	1	BQL(0.010) (RPD=NA)	1	0.014	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.427	1	0.560	1	0.557 (RPD=0.54)	1	0.293	1	0.291 (RPD=0.68)	1	0.419	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.013	1	BQL(0.002)	1	BQL(0.002) (RPD=NA)	1	0.013	1	0.013 (RPD=0.00)	1	BQL(0.002)	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.017)	1	0.025	1	0.021 (RPD=17.39)	1	BQL(0.016)	1	BQL(0.017) (RPD=NA)	1	BQL(0.015)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1	BQL(0.003)	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	15.2	1	9.19	1	9.25 (RPD=0.65)	1	10.1	1	10.1 (RPD=0.00)	1	8.53	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	17.4	1	117	1	117 (RPD=0.00)	1	32.3	1	32.0 (RPD=0.93)	1	27.3	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.817	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Shaw Environmental, Inc.

Analytical Service Results Report

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Sample Results (1, 2)

Analysts:	S. Markham/S. Saye			Field Sample ID		ML 3-5		ML 2-2		ML 2-3		ML 2-5		ML 5-2		ML 5-3	
				Sample Lab ID		3519-15		3519-16		3519-17		3519-18		3519-19		3519-20	
Method:	RSKSOP 213(2)			Date Collected		8/22/06		8/22/06		8/22/06		8/22/06		8/23/06		8/23/06	
				Date Analyzed		9/12/06		9/12/06		9/12/06		9/12/06		9/12/06		9/13/06	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	0.152	1	0.408	1	6.50	1	2.07	1	0.399	1	0.141	1	
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	BQL(0.010)	1	0.037	1	0.064	1	BQL(0.017)	1	0.033	1	0.142	1	
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.118	1	0.130	1	0.163	1	0.148	1	0.132	1	0.117	1	
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.023	1	0.146	1	0.157	1	0.031	1	0.184	1	0.098	1	
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	26.4	1	111	1	101	1	27.0	1	68.7	1	58.6	1	
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	0.009	1	BQL(0.003)	1	ND	1	ND	1	
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	3.19	1	61.6	1	23.2	1	2.75	1	75.5	1	64.3	1	
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.04	1	2.85	1	2.55	1	1.43	1	3.49	1	1.20	1	
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	3.64	1	32.6	1	28.1	1	4.38	1	26.7	1	24.2	1	
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.146	1	0.922	1	0.585	1	0.103	1	0.490	1	0.286	1	
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)	1	0.006	1	0.009	1	0.006	1	BQL(0.004)	1	0.005	1	
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	69.2	1	220	1	430	1	210	1	274	1	176	1	
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	BQL(0.004)	1	ND	1	ND	1	ND	1	
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1	ND	1	BQL(0.007)	1	ND	1	ND	1	ND	1	
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.004)	1	BQL(0.007)	1	BQL(0.007)	1	BQL(0.003)	1	BQL(0.003)	1	BQL(0.010)	1	
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.007)	1	0.018	1	0.017	1	BQL(0.006)	1	BQL(0.009)	1	BQL(0.011)	1	
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.279	1	0.711	1	0.844	1	0.250	1	0.471	1	0.572	1	
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.003)	1	0.012	1	0.232	1	0.058	1	0.011	1	0.005	1	
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.006)	1	0.029	1	0.024	1	BQL(0.014)	1	0.025	1	0.019	1	
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1	BQL(0.003)	1	0.013	1	BQL(0.005)	1	ND	1	ND	1	
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	ND	1	BQL(0.011)	1	ND	1	ND	1	BQL(0.007)	1	
Sillicon (Si)	7440-21-3	mg/L	0.049	0.163	15.3	1	13.6	1	20.5	1	17.4	1	9.36	1	9.11	1	
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	16.7	1	129	1	280	1	83.6	1	133	1	63.6	1	
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	1.28	1	ND	1	0.055	1	1.42	1	ND	1	ND	1	
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. " -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
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Technical Directive:

3ME352HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML 5-3		ML 5-4		ML 5-4		ML 5-5		ML 5-6		ML 5-7	
Names	Codes		MDL	QL	Sample Lab ID		3519-20 Lab Dup.*		3519-21		3519-21 Lab Dup.		3519-22		3519-23	
					Date Collected		8/23/06		8/23/06		8/23/06		8/23/06		8/23/06	
					Date Analyzed		9/13/06		9/13/06		9/13/06		9/13/06		9/13/06	
					Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	BQL(0.130) (RPD=NA)	1	4.80	1	4.80 (RPD=0.00)	1	1.26	1	BQL(0.076)	1	BQL(0.040)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.136 (RPD=4.32)	1	0.030	1	0.027 (RPD=10.53)	1	BQL(0.017)	1	BQL(0.011)	1	BQL(0.018)	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.120 (RPD=2.53)	1	0.192	1	0.195 (RPD=1.55)	1	0.198	1	0.156	1	0.152	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.096 (RPD=2.06)	1	0.051	1	0.051 (RPD=0.00)	1	0.034	1	0.047	1	0.022	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	57.9 (RPD=1.20)	1	41.9	1	41.9 (RPD=0.00)	1	35.3	1	42.3	1	38.2	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND (RPD=NA)	1	0.005	1	0.005 (RPD=0.00)	1	BQL(0.001)	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	63.0 (RPD=2.04)	1	17.5	1	17.5 (RPD=0.00)	1	9.07	1	13.7	1	3.57	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.24 (RPD=3.28)	1	1.55	1	1.53 (RPD=1.30)	1	1.56	1	1.63	1	1.63	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	24.0 (RPD=0.83)	1	9.10	1	9.11 (RPD=0.11)	1	6.82	1	8.60	1	5.66	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.288 (RPD=0.70)	1	0.262	1	0.266 (RPD=1.52)	1	0.280	1	0.362	1	0.082	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.005 (RPD=0.00)	1	BQL(0.003)	1	BQL(0.004) (RPD=NA)	1	BQL(0.004)	1	BQL(0.003)	1	BQL(0.002)	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	174 (RPD=1.14)	1	205	1	204 (RPD=0.49)	1	281	1	234	1	279	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	BQL(0.002) (RPD=NA)	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1	ND	1	ND	1	BQL(0.003)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	0.011 (RPD=NA)	1	BQL(0.009)	1	BQL(0.010) (RPD=NA)	1	BQL(0.009)	1	BQL(0.011)	1	BQL(0.009)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.010) (RPD=NA)	1	BQL(0.008)	1	BQL(0.007) (RPD=NA)	1	BQL(0.008)	1	BQL(0.008)	1	ND	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.564 (RPD=1.41)	1	0.372	1	0.373 (RPD=0.27)	1	0.311	1	0.270	1	0.310	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.004) (RPD=NA)	1	0.126	1	0.126 (RPD=0.00)	1	0.035	1	BQL(0.004)	1	BQL(0.002)	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.019) (RPD=NA)	1	BQL(0.014)	1	BQL(0.014) (RPD=NA)	1	BQL(0.013)	1	BQL(0.015)	1	BQL(0.014)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND (RPD=NA)	1	0.008	1	0.008 (RPD=0.00)	1	BQL(0.003)	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND (RPD=NA)	1	BQL(0.014)	1	BQL(0.014) (RPD=NA)	1	BQL(0.007)	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	9.09 (RPD=0.22)	1	19.1	1	19.1 (RPD=0.00)	1	14.3	1	13.6	1	13.6	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	64.1 (RPD=0.78)	1	78.5	1	79.2 (RPD=0.89)	1	80.8	1	91.2	1	77.1	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	ND (RPD=NA)	1	0.265	1	0.266 (RPD=0.38)	1	0.230	1	0.104	1	0.139	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

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Shaw Environmental, Inc.

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML 7-2		ML 7-2		ML 7-3		ML 7-4		ML 7-5		ML 7-6	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	ND	1	ND (RPD=NA)	1	BQL(0.125)	1	0.356	1	BQL(0.067)	1	BQL(0.117)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.020	1	0.020 (RPD=0.00)	1	0.197	1	0.020	1	BQL(0.014)	1	0.024	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.149	1	0.151 (RPD=1.33)	1	0.193	1	0.218	1	0.198	1	0.283	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.137	1	0.135 (RPD=1.47)	1	0.096	1	0.055	1	0.015	1	0.038	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	93.8	1	92.8 (RPD=1.07)	1	71.6	1	60.4	1	23.7	1	32.9	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	71.7	1	71.0 (RPD=0.98)	1	56.9	1	17.4	1	2.86	1	9.49	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	4.66	1	4.74 (RPD=1.70)	1	1.67	1	2.20	1	1.18	1	1.50	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	26.9	1	26.9 (RPD=0.00)	1	27.0	1	11.4	1	3.92	1	6.95	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.771	1	0.773 (RPD=0.26)	1	0.404	1	0.441	1	0.136	1	0.218	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.006	1	0.005 (RPD=18.18)	1	BQL(0.004)	1	0.006	1	0.005	1	0.007	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	324	1	320 (RPD=1.24)	1	418	1	350	1	248	1	466	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	BQL(0.002)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	0.014	1	0.012 (RPD=15.38)	1	0.011	1	0.013	1	BQL(0.007)	1	BQL(0.009)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	0.013	1	0.012 (RPD=8.00)	1	0.012	1	BQL(0.007)	1	ND	1	BQL(0.007)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.728	1	0.718 (RPD=1.38)	1	0.773	1	0.485	1	0.226	1	0.204	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1	BQL(0.004)	1	0.013	1	BQL(0.002)	1	0.004	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	0.022	1	0.023 (RPD=4.44)	1	0.021	1	0.022	1	BQL(0.012)	1	BQL(0.015)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1	ND (RPD=NA)	1	BQL(0.004)	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	ND (RPD=NA)	1	ND	1	ND	1	BQL(0.017)	1	BQL(0.020)	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	13.3	1	13.3 (RPD=0.00)	1	9.74	1	13.1	1	13.5	1	13.0	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	147	1	147 (RPD=0.00)	1	174	1	145	1	72.8	1	152	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	ND	1	ND (RPD=NA)	1	ND	1	ND	1	0.578	1	0.148	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

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Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

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Technical Directive:

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analysts:	S. Markham/S. Saye		Field Sample ID		ML 7-7		ML 6-2		ML 6-4		ML 6-6		ML 6-6		ML 6-6		ML 2-2	
			Sample Lab ID		3519-30		3519-31		3519-32		3519-33		3519-33 Lab Dup.*		3519-34			
			Date Collected		8/24/06		8/24/06		8/24/06		8/24/06		8/24/06		8/24/06			
			Date Analyzed		9/13/06		9/13/06		9/13/06		9/13/06		9/13/06		9/13/06			
Method:	RSKSOP 213(2)		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
	Names	Codes																
	Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	
	Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	BQL(0.060)	1	1.41	1	4.14	1	0.667	1	0.664 (RPD=0.45)	1	BQL(0.053)	1	
	Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.026	1	0.023	1	BQL(0.015)	1	BQL(0.009)	1	BQL(0.016) (RPD=NA)	1	0.027	1	
	Boron (B)	7440-42-8	mg/L	0.014	0.049	0.228	1	0.145	1	0.245	1	0.127	1	0.126 (RPD=0.79)	1	0.399	1	
	Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.051	1	0.139	1	0.032	1	0.035	1	0.036 (RPD=2.82)	1	0.154	1	
	Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	
	Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	65.1	1	76.3	1	35.4	1	33.1	1	33.3 (RPD=0.60)	1	64.2	1	
	Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	
	Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	
	Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	BQL(0.002)	1	0.005	1	ND	1	ND (RPD=NA)	1	ND	1	
	Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	
	Iron (Fe)	7439-89-6	mg/L	0.006	0.019	7.47	1	44.0	1	8.14	1	10.9	1	11.4 (RPD=4.48)	1	41.7	1	
	Potassium (K)	7440-09-7	mg/L	0.061	0.204	2.08	1	4.44	1	1.68	1	1.72	1	1.71 (RPD=0.58)	1	7.43	1	
	Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	9.59	1	24.2	1	5.79	1	7.20	1	7.28 (RPD=1.1)	1	21.6	1	
	Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.184	1	0.644	1	0.206	1	0.342	1	0.341 (RPD=0.29)	1	0.431	1	
	Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.003)	1	0.006	1	0.005	1	0.005	1	0.005 (RPD=0.00)	1	BQL(0.004)	1	
	Sodium (Na)	7440-23-5	mg/L	0.047	0.155	502	1	207	1	349	1	149	1	149 (RPD=0.00)	1	356	1	
	Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	
	Lead (Pb)	7439-92-1	mg/L	0.002	0.008	BQL(0.003)	1	BQL(0.003)	1	BQL(0.004)	1	ND	1	BQL(0.003) (RPD=NA)	1	BQL(0.002)	1	
	Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	0.012	1	0.014	1	BQL(0.010)	1	BQL(0.010)	1	BQL(0.009) (RPD=NA)	1	0.012	1	
	Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.010)	1	BQL(0.011)	1	BQL(0.005)	1	ND	1	BQL(0.006) (RPD=NA)	1	BQL(0.008)	1	
	Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.522	1	0.494	1	0.370	1	0.182	1	0.182 (RPD=0.00)	1	0.562	1	
	Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.003)	1	0.039	1	0.130	1	0.017	1	0.016 (RPD=6.06)	1	BQL(0.003)	1	
	Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.017)	1	0.020	1	BQL(0.013)	1	BQL(0.011)	1	BQL(0.013) (RPD=NA)	1	BQL(0.018)	1	
	Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1	ND	1	0.010	1	BQL(0.003)	1	ND (RPD=NA)	1	ND	1	
	Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	BQL(0.008)	1	ND	1	BQL(0.008)	1	BQL(0.007)	1	ND (RPD=NA)	1	0.994	1	
	Sillicon (Si)	7440-21-3	mg/L	0.049	0.163	12.6	1	14.7	1	18.5	1	15.5	1	15.5 (RPD=0.00)	1	9.23	1	
	Sulfur (S)	7704-34-9	mg/L	0.102	0.341	239	1	95.6	1	141	1	49.0	1	48.7 (RPD=0.61)	1	117	1	
	Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.101	1	ND	1	0.523	1	ND	1	ND (RPD=NA)	1	0.093	1	
	Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	

Comments:

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Notes:

- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
- " -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

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Technical Directive: 3ME352HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 213(2)

Analytes		Unit	Field Sample ID				ML 4-4		ML 4-6		FIELD BLANK		ML 5-6 DUP		ML 5-6 DUP			
Names	Codes		MDL	QL	Data	DF											Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1			ND	1	ND	1	ND	1	ND (RPD=NA)	1		
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	BQL(0.130)	1			0.143	1	ND	1	BQL(0.103)	1	BQL(0.094) (RPD=NA)	1		
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.044	1			BQL(0.008)	1	ND	1	BQL(0.013)	1	BQL(0.011) (RPD=NA)	1		
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.171	1			0.139	1	ND	1	0.159	1	0.158 (RPD=0.63)	1		
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.044	1			0.038	1	ND	1	0.047	1	0.047 (RPD=0.00)	1		
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1			ND	1	ND	1	ND	1	ND (RPD=NA)	1		
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	42.9	1			40.4	1	BQL(0.035)	1	42.1	1	42.4 (RPD=0.71)	1		
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1			ND	1	ND	1	ND	1	ND (RPD=NA)	1		
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1			ND	1	ND	1	ND	1	ND (RPD=NA)	1		
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1			ND	1	ND	1	ND	1	ND (RPD=NA)	1		
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1			ND	1	ND	1	ND	1	ND (RPD=NA)	1		
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	15.1	1			5.66	1	ND	1	13.9	1	14.0 (RPD=0.72)	1		
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.57	1			1.54	1	ND	1	2.44	1	2.43 (RPD=0.41)	1		
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	11.7	1			9.18	1	ND	1	8.60	1	8.76 (RPD=1.84)	1		
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.269	1			0.322	1	ND	1	0.363	1	0.361 (RPD=0.55)	1		
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.003)	1			BQL(0.002)	1	ND	1	BQL(0.004)	1	BQL(0.003) (RPD=NA)	1		
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	186	1			188	1	BQL(0.104)	1	234	1	238 (RPD=1.69)	1		
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1			ND	1	ND	1	ND	1	ND (RPD=NA)	1		
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1			ND	1	ND	1	ND	1	BQL(0.003) (RPD=NA)	1		
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.010)	1			BQL(0.008)	1	BQL(0.005)	1	BQL(0.011)	1	BQL(0.009) (RPD=NA)	1		
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.009)	1			BQL(0.005)	1	ND	1	BQL(0.006)	1	BQL(0.007) (RPD=NA)	1		
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.414	1			0.280	1	ND	1	0.267	1	0.272 (RPD=1.86)	1		
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.004)	1			0.006	1	ND	1	0.005	1	0.005 (RPD=0.00)	1		
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.014)	1			BQL(0.015)	1	ND	1	BQL(0.017)	1	BQL(0.018) (RPD=NA)	1		
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1			ND	1	ND	1	ND	1	ND (RPD=NA)	1		
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1			ND	1	ND	1	1.93	1	1.97 (RPD=2.05)	1		
Sillicon (Si)	7440-21-3	mg/L	0.049	0.163	10.3	1			13.0	1	0.168	1	13.5	1	13.6 (RPD=0.74)	1		
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	42.8	1			56.0	1	ND	1	91.7	1	92.5 (RPD=0.87)	1		
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.071	1			0.049	1	ND	1	0.327	1	0.319 (RPD=2.48)	1		
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1			ND	1	ND	1	ND	1	ND (RPD=NA)	1		

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. " -" denotes that the information is not available or the analyte is not analyzed.

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Analytical Service Results Report

Laboratory: **Metals** Report Date: **9/26/06**

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Technical Directive: **3ME352HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	FIELD BLANK	PMW-3	PMW-5	PMW-5	PMW-5 DUPLICATE	PMW-6
Sample Lab ID	3519-01	3519-02	3519-03	3519-03 Lab Dup.	3519-04	3519-05
Date Collected	8/21/06	8/21/06	8/21/06	8/21/06	8/21/06	8/21/06
Date Analyzed	9/7, 9/8, 9/12 & 9/21/06	9/7, 9/8 & 9/21/06	9/7, 9/8 & 9/21/06	9/7, 9/8 & 9/21/06	9/7, 9/8 & 9/21/06	9/7, 9/8 & 9/21/06

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	0.261	1	60.7	1	33.6	1	33.1 (RPD=1.50)	1	32.8	1	41.9	1
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	0.567	1	1.59	1	1.27	1	1.26 (RPD=0.79)	1	1.17	1	1.16	1
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	ND	1	2.12	1	2.17	1	2.20 (RPD=1.37)	1	1.95	1	1.67	1
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	2.08	1	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	0.320	1	0.740	1	0.490	1	0.490 (RPD=0.00)	1	0.448	1	0.437	1
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	ND	1	7.85	1	7.28	1	7.15 (RPD=1.80)	1	7.61	1	7.20	1
Uranium (U)	7440-61-1	µg/L	0.002	0.008	ND	1	0.104	1	0.067	1	0.067 (RPD=0.00)	1	0.063	1	0.032	1
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	0.452	1	6.59	1	8.75	1	8.70 (RPD=0.57)	1	4.96	1	4.15	1
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	1	ND	1	BQL(0.046)	1	BQL(0.046) (RPD=NA)	1	ND	1	ND	1

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Laboratory: **Metals** Report Date: **9/26/06**

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Technical Directive: **3ME352HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 1-4	ML 1-4	ML 1-6	ML 2-4	ML 2-6	ML 2-6
Sample Lab ID	3519-06	3519-06 Lab Dup.*	3519-07	3519-08	3519-09	3519-09 Lab Dup.
Date Collected	8/21/06	8/21/06	8/21/06	8/21/06	8/21/06	8/21/06
Date Analyzed	9/7, 9/8 & 9/21/06	9/7, 9/8 & 9/21/06	9/7, 9/8 & 9/21/06	9/7, 9/8 & 9/21/06	9/8 & 9/21/06	9/8 & 9/21/06

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	11.8	1	11.6 (RPD=1.71)	1	5.35	1	32.3	1	4.99	1	4.88 (RPD=2.23)	1
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	4.83	1	4.96 (RPD=2.66)	1	4.63	1	3.39	1	0.605	1	0.533 (RPD=12.65)	1
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	2.91	1	2.87 (RPD=1.38)	1	3.66	1	2.54	1	1.56	1	1.55 (RPD=0.64)	1
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	1.86	1	2.28 (RPD=20.29)	1	4.10	1	2.68	1	0.529	1	0.486 (RPD=8.47)	1
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	6.83	1	6.78 (RPD=0.73)	1	4.87	1	7.78	1	3.62	1	3.46 (RPD=4.52)	1
Uranium (U)	7440-61-1	µg/L	0.002	0.008	0.427	1	0.436 (RPD=2.09)	1	0.340	1	5.20	1	4.19	1	4.14 (RPD=1.20)	1
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	5.17	1	5.21 (RPD=0.77)	1	7.28	1	4.75	1	8.23	1	8.07 (RPD=1.96)	1
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	BQL(0.091)	1	BQL(0.080) (RPD=NA)	1	BQL(0.061)	1	ND	1	ND	1	ND (RPD=NA)	1

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts:	S. Markham/S. Saye	Field Sample ID	ML 3-4	ML 3-6	ML 4-2	ML 3-2	ML 3-3	ML 3-3
		Sample Lab ID	3519-10	3519-11	3519-12	3519-13	3519-14	3519-14 Lab Dup.*
		Date Collected	8/22/06	8/22/06	8/22/06	8/22/06	8/22/06	8/22/06
		Date Analyzed	9/8 & 9/21/06	9/8 & 9/21/06	9/8 & 9/21/06	9/8 & 9/21/06	9/8 & 9/21/06	9/8 & 9/21/06
Method:	RSKSOP 257(1)							

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	7.52	1	1.63	1	12.4	1	22.1	1	84.7	1	83.8 (RPD=1.07)	1
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	14.6	1	0.925	1	0.848	1	1.04	1	0.629	1	0.875 (RPD=32.71)	1
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	4.60	1	1.48	1	2.07	1	1.82	1	1.51	1	1.50 (RPD=0.66)	1
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	3.46	1	0.366	1	0.891	1	0.517	1	0.435	1	0.568 (RPD=26.52)	1
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	5.18	1	4.48	1	6.06	1	9.41	1	8.40	1	8.38 (RPD=0.24)	1
Uranium (U)	7440-61-1	µg/L	0.002	0.008	2.23	1	0.116	1	0.134	1	0.453	1	1.19	1	1.20 (RPD=0.84)	1
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	14.6	1	2.50	1	1.35	1	1.90	1	4.22	1	2.87 (RPD=38.08)	1
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	1	BQL(0.038)	1	BQL(0.056)	1	ND	1	ND	1	ND (RPD=NA)	1

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: **3ME352HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 3-5	ML 2-2	ML 2-3	ML 2-3	ML 2-5	ML 5-2
Sample Lab ID	3519-15	3519-16	3519-17	3519-17 Lab Dup.	3519-18	3519-19
Date Collected	8/22/06	8/22/06	8/22/06	8/22/06	8/22/06	8/23/06
Date Analyzed	9/8 & 9/21/06	9/8 & 9/21/06	9/8, 9/11 & 9/21/06	9/8, 9/11 & 9/21/06	9/8, 9/11 & 9/21/06	9/8, 9/11 & 9/21/06

Analytes		Unit	MDL	QL	Data		DF	Data		DF	Data		DF	Data		DF	Data		DF
Names	Codes																		
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	6.22		1	14.6		1	46.3		1	45.4 (RPD=1.96)		1	7.17		1
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	0.664		1	1.35		1	9.96		1	9.81 (RPD=1.52)		1	4.21		1
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	1.07		1	2.51		1	4.89		1	4.59 (RPD=6.33)		1	2.04		1
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—		—	—		—	—		—	—		—	—		—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	0.217		1	0.547		1	8.04		1	8.02 (RPD=0.25)		1	1.52		1
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	4.60		1	4.93		1	4.51		1	4.61 (RPD=2.19)		1	4.28		1
Uranium (U)	7440-61-1	µg/L	0.002	0.008	0.116		1	0.241		1	3.53		1	3.51 (RPD=0.57)		1	3.25		1
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	1.93		1	2.59		1	11.5		1	11.4 (RPD=0.87)		1	5.91		1
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND		1	ND		1	BQL(0.057)		1	BQL(0.051) (RPD=NA)		1	ND		1

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: 3ME352HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 257(1)

Field Sample ID		ML 5-3		ML 5-3		ML 5-4		ML 5-5		ML 5-6		ML 5-6	
Sample Lab ID		3519-20		3519-20 Lab Dup.*		3519-21		3519-22		3519-23		3519-23 Lab Dup.	
Date Collected		8/23/06		8/23/06		8/23/06		8/23/06		8/23/06		8/23/06	
Date Analyzed		9/8, 9/11 & 9/21/06		9/8, 9/11 & 9/21/06		9/8, 9/11 & 9/21/06		9/8, 9/11 & 9/21/06		9/8, 9/11, 9/21 & 9/22/06		9/8, 9/11, 9/21 & 9/22/06	
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.027	0.089	115	1	112 (RPD=2.64)	1	19.6	1	6.60	1	1.03	1	1.03 (RPD=0.00)	1
0.094	0.352	1.07	1	0.933 (RPD=13.68)	1	5.72	1	2.02	1	0.478	1	0.459 (RPD=4.06)	1
0.034	0.115	1.60	1	1.99 (RPD=21.73)	1	3.05	1	1.47	1	1.71	1	1.74 (RPD=1.74)	1
0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
0.020	0.067	0.375	1	0.351 (RPD=6.61)	1	2.15	1	0.511	1	0.209	1	0.200 (RPD=4.40)	1
0.203	0.677	5.32	1	5.02 (RPD=5.80)	1	5.71	1	4.13	1	3.47	1	3.12 (RPD=10.62)	1
0.002	0.008	2.14	1	1.92 (RPD=10.84)	1	0.698	1	1.54	1	0.047	1	0.046 (RPD=2.15)	1
0.123	0.411	4.42	1	3.47 (RPD=24.08)	1	9.98	1	4.05	1	13.3	1	13.2 (RPD=0.75)	1
0.033	0.111	ND	1	ND (RPD=NA)	1	BQL(0.065)	1	ND	1	BQL(0.044)	1	BQL(0.035) (RPD=NA)	1

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 9/26/06

Technical Directive: 3ME352HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 257(1)

Analysts:	S. Markham/S. Saye		Field Sample ID				ML 5-7		ML 7-2		ML 7-3		ML 7-3		ML 7-4		ML 7-5	
	Method:	RKSOP 257(1)	Sample Lab ID				3519-24		3519-25		3519-26		3519-26 Lab Dup.*		3519-27		3519-28	
			Date Collected				8/23/06		8/23/06		8/23/06		8/23/06		8/23/06			
			Date Analyzed				9/8, 9/11, 9/21 & 9/22/06		9/8, 9/11, 9/21 & 9/22/06		9/8, 9/11, 9/21 & 9/22/06		9/8, 9/11, 9/21 & 9/22/06		9/8, 9/11, 9/21 & 9/22/06			
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF		
Names	Codes																	
Arsenic (As)		7440-38-2	µg/L	0.027	0.089	6.61	1	8.09	1	162	1	160 (RPD=1.24)	1	6.40	1	6.07	1	
Chromium (Cr)		7440-47-3	µg/L	0.094	0.352	0.284	1	1.28	1	1.03	1	0.948 (RPD=8.29)	1	1.00	1	0.652	1	
Copper (Cu)		7440-50-8	µg/L	0.034	0.115	1.10	1	1.82	1	2.38	1	2.15 (RPD=10.15)	1	2.01	1	0.797	1	
Iron (Fe)		7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—	
Lead (Pb)		7439-92-1	µg/L	0.020	0.067	0.308	1	0.265	1	0.677	1	0.638 (RPD=5.93)	1	0.477	1	0.236	1	
Selenium (Se)		7782-49-2	µg/L	0.203	0.677	3.22	1	7.23	1	7.22	1	7.27 (RPD=0.69)	1	4.90	1	4.56	1	
Uranium (U)		7440-61-1	µg/L	0.002	0.008	0.476	1	0.060	1	0.322	1	0.323 (RPD=0.31)	1	0.406	1	2.43	1	
Zinc (Zn)		7440-62-2	µg/L	0.123	0.411	1.58	1	1.68	1	3.44	1	1.38 (RPD=85.48)	1	3.68	1	13.8	1	
Mercury (Hg)		7439-97-6	µg/L	0.033	0.111	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: **3ME352HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 7-5	ML 7-6	ML 7-7	ML 6-2	ML 6-4	ML 6-6
Sample Lab ID	3519-28 Lab Dup.	3519-29	3519-30	3519-31	3519-32	3519-33
Date Collected	8/23/06	8/24/06	8/24/06	8/24/06	8/24/06	8/24/06
Date Analyzed	9/8, 9/11, 9/21 & 9/22/06	9/8, 9/11, 9/21 & 9/22/06	9/8, 9/11, 9/21 & 9/22/06	9/8, 9/11, 9/21 & 9/22/06	9/8, 9/11, 9/21 & 9/22/06	9/8, 9/11, 9/21 & 9/22/06

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	5.93 (RPD=2.33)	1	12.0	1	9.18	1	8.54	1	7.72	1	3.62	1
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	0.633 (RPD=2.96)	1	0.836	1	0.515	1	1.95	1	5.57	1	1.11	1
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	0.834 (RPD=4.54)	1	1.37	1	1.64	1	2.68	1	1.72	1	1.39	1
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	0.238 (RPD=0.84)	1	0.247	1	1.12	1	0.869	1	1.32	1	0.539	1
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	4.41 (RPD=3.34)	1	3.97	1	3.64	1	5.21	1	4.53	1	3.94	1
Uranium (U)	7440-61-1	µg/L	0.002	0.008	2.42 (RPD=0.41)	1	1.34	1	1.05	1	0.247	1	2.13	1	0.107	1
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	13.6 (RPD=1.46)	1	14.9	1	5.01	1	3.57	1	5.21	1	4.01	1
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

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Technical Directive: **3ME352HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID		ML 6-6		ML 2-2		ML 4-4		ML 4-6		FIELD BLANK		ML 5-6 DUP	
Sample Lab ID		3519-33 Lab Dup.*		3519-34		3519-35		3519-36		3519-37		3519-38	
Date Collected		8/24/06		8/24/06		8/24/06		8/24/06		8/24/06		8/23/06	
Date Analyzed		9/8, 9/11, 9/21 & 9/22/06		9/8, 9/11, 9/21 & 9/22/06		9/8, 9/11, 9/21 & 9/22/06		9/8, 9/11, 9/21 & 9/22/06		9/8, 9/11, 9/12, 9/21 & 9/22/06		9/8, 9/11 & 9/21/06	
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.027	0.089	3.56 (RPD=1.67)	1	13.5	1	28.0	1	1.25	1	ND	1	1.15	1
0.094	0.352	0.878 (RPD=23.34)	1	1.01	1	0.843	1	0.758	1	BQL(0.178)	1	0.499	1
0.034	0.115	1.12 (RPD=21.51)	1	2.16	1	1.69	1	1.44	1	0.979	1	1.79	1
0.251	0.836	—	—	—	—	—	—	—	—	BQL(0.726)	1	—	—
0.020	0.067	0.457 (RPD=16.47)	1	0.214	1	0.203	1	0.346	1	0.133	1	0.248	1
0.203	0.677	3.75 (RPD=4.94)	1	6.14	1	5.67	1	3.73	1	BQL(0.250)	1	3.42	1
0.002	0.008	0.108 (RPD=0.93)	1	0.133	1	1.03	1	0.137	1	ND	1	0.046	1
0.123	0.411	3.43 (RPD=15.59)	1	1.73	1	2.69	1	1.66	1	BQL(0.398)	1	4.89	1
0.033	0.111	ND (RPD=NA)	1	BQL(0.059)	1	ND	1	ND	1	ND	1	ND	1

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Laboratory: **Metals** Report Date: **9/20/06**

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Technical Directive: **3ME353HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Field Sample ID	FIELD BLANK	PMW-3	PMW-5	PMW-5 Duplicate	PMW-6	ML 1-4
Sample Lab ID	3520-01	3520-02	3520-03	3520-04	3520-05	3520-06
Date Collected	8/21/06	8/21/06	8/21/06	8/21/06	8/21/06	8/21/06
Date Analyzed	8/28, 8/29, 8/30 & 9/12/06	8/28, 8/29 & 8/30/06	8/28, 8/29 & 8/30/06	8/28, 8/29 & 8/30/06	8/28, 8/29 & 8/30/06	8/28, 8/29 & 8/30/06

Analytes		Unit	MDL	QL	Data		DF	Data		DF	Data		DF	Data		DF	Data		DF
Names	Codes																		
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	ND		1	75.4		1	37.8		1	36.6		1	52.4		1
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	ND		1	5.72		1	5.57		1	6.87		1	3.00		1
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	ND		1	0.365		1	0.346		1	0.275		1	0.291		1
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	BQL(0.649)		1	—		—	—		—	—		—	—		—
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND		1	ND		1	BQL(0.038)		1	ND		1	ND		1
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	ND		1	6.23		1	6.46		1	6.19		1	5.96		1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND		1	0.053		1	0.061		1	0.059		1	0.034		1
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	0.653		1	6.80		1	10.3		1	8.95		1	7.03		1
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	BQL(0.044)		1	BQL(0.045)		1	BQL(0.045)		1	BQL(0.031)		1	ND		1

Comments:

No problems noted. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

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Technical Directive: **3ME353HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Analytes		Unit	MDL		QL		Data		DF		Data		DF		Data		DF	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	18.8 (RPD=0.53)	1	5.04	1	44.5	1	6.25	1	6.72	1	0.760	1		
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	9.66 (RPD=2.52)	1	5.69	1	17.4	1	15.1	1	12.2	1	13.1	1		
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	2.27 (RPD=0.44)	1	0.348	1	0.569	1	0.492	1	0.252	1	0.269	1		
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	2.00 (RPD=0.00)	1	ND	1	0.269	1	BQL(0.057)	1	0.349	1	BQL(0.046)	1		
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	10.5 (RPD=0.95)	1	4.83	1	8.78	1	6.42	1	6.04	1	5.48	1		
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.177 (RPD=2.23)	1	0.051	1	4.44	1	5.69	1	0.323	1	0.065	1		
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	4.22 (RPD=0.95)	1	1.39	1	3.88	1	4.23	1	3.31	1	1.29	1		
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	BQL(0.087) (RPD=NA)	1	BQL(0.051)	1	ND	1	ND	1	BQL(0.031)	1	ND	1		

Comments:

No problems noted. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: **3ME353HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 4-2	ML 3-2	ML 3-3	ML 3-5	ML 3-5	ML 2-2
Sample Lab ID	3520-12	3520-13	3520-14	3520-15	3520-15 Lab Dup.	3520-16
Date Collected	8/22/06	8/22/06	8/22/06	8/22/06	8/22/06	8/22/06
Date Analyzed	8/28, 8/29 & 8/30/06	8/28, 8/29 & 8/30/06	8/28, 8/29 & 8/30/06	8/28, 8/29 & 8/30/06	8/28, 8/29 & 8/30/06	8/28, 8/29 & 8/30/06

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	16.8	1	31.5	1	130	1	7.01	1	7.01 (RPD=0.00)	1	20.4	1
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	20.8	1	10.4	1	21.5	1	10.3	1	9.93 (RPD=3.66)	1	11.0	1
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	0.733	1	0.543	1	1.90	1	0.142	1	0.140 (RPD=1.42)	1	1.09	1
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	BQL(0.026)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	8.37	1	8.72	1	8.27	1	5.24	1	5.31 (RPD=1.33)	1	6.87	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.157	1	0.459	1	1.39	1	0.088	1	0.086 (RPD=0.00)	1	0.159	1
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	2.13	1	17.7	1	6.05	1	1.47	1	1.51 (RPD=2.68)	1	9.84	1
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	BQL(0.045)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1

Comments:
 No problems noted. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Laboratory: **Metals** Report Date: **9/20/06**

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Technical Directive: **3ME353HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Analysts:	Steve Markham		Field Sample ID		ML 2-3		ML 2-5		ML 5-2		ML 5-3		ML 5-3		ML 5-4		
			Sample Lab ID		3520-17		3520-18		3520-19		3520-20		3520-20 Lab Dup.		3520-21		
			Date Collected		8/22/06		8/22/06		8/23/06		8/23/06		8/23/06		8/23/06		
			Date Analyzed		8/28, 8/29 & 8/30/06		8/28, 8/29 & 8/30/06		8/28, 8/29 & 8/30/06		8/28, 8/29 & 8/30/06		8/28, 8/29 & 8/30/06		8/28, 8/29 & 8/30/06		
Method:	RSKSOP 257(1)		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Analytes			µg/L	0.024	0.080	63.0	1	7.62	1	16.0	1	183	1	181 (RPD=1.10)	1	23.9	1
Names		Codes															
Arsenic (As)		7440-38-2															
Chromium (Cr)		7440-47-3															
Copper (Cu)		7440-50-8															
Iron (Fe)		7439-89-6															
Lead (Pb)		7439-92-1															
Selenium (Se)		7782-49-2															
Uranium (U)		7440-61-1															
Zinc (Zn)		7440-62-2															
Mercury (Hg)		7439-97-6															

Comments:

No problems noted. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: 3ME353HW

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(1)

Analysts:	Steve Markham		Field Sample ID		ML 5-5		ML 5-6		ML 5-7		ML 7-2		ML 7-3		ML 7-4			
	RSKSOP 257(1)				Sample Lab ID		3520-22		3520-23		3520-24		3520-25		3520-26		3520-27	
					Date Collected		8/23/06		8/23/06		8/23/06		8/23/06		8/23/06		8/23/06	
					Date Analyzed		8/28, 8/29 & 8/30/06		8/28, 8/29 & 8/30/06		8/28, 8/29 & 8/30/06		8/28, 8/29 & 8/30/06		8/28, 8/29 & 8/30/06		8/28, 8/29 & 8/30/06	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF		
Names	Codes																	
Arsenic (As)		7440-38-2	µg/L	0.024	0.080	7.95	1	1.63	1	10.9	1	9.60	1	208	1	8.80	1	
Chromium (Cr)		7440-47-3	µg/L	0.085	0.317	6.53	1	8.98	1	5.75	1	11.6	1	12.5	1	18.4	1	
Copper (Cu)		7440-50-8	µg/L	0.031	0.104	0.295	1	0.289	1	0.352	1	0.947	1	0.825	1	0.609	1	
Iron (Fe)		7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—	
Lead (Pb)		7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Selenium (Se)		7782-49-2	µg/L	0.183	0.610	5.32	1	4.90	1	4.26	1	8.44	1	8.77	1	6.22	1	
Uranium (U)		7440-61-1	µg/L	0.002	0.007	1.43	1	0.052	1	0.726	1	0.083	1	0.342	1	0.200	1	
Zinc (Zn)		7440-62-2	µg/L	0.111	0.370	1.62	1	1.67	1	0.614	1	5.38	1	3.44	1	1.34	1	
Mercury (Hg)		7439-97-6	µg/L	0.030	0.100	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	

Comments:
No problems noted. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **9/20/06**

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Technical Directive: **3ME353HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Analytes		Unit	Field Sample ID		ML 7-5		ML 7-6		ML 7-6		ML 7-7		ML 6-2		ML 6-4	
Names	Codes		Sample Lab ID													
			Date Collected		8/23/06		8/24/06		8/24/06		8/24/06		8/24/06		8/24/06	
			Date Analyzed		8/28, 8/29 & 8/30/06		8/28, 8/29, 8/30 & 09/07/06		8/28, 8/29, 8/30 & 09/07/06		8/28, 8/29, 8/30 & 09/07/06		8/28, 8/29, 8/30 & 09/07/06		8/28, 8/29, 8/30 & 09/07/06	
			MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	8.60	1	11.0	1	10.5 (RPD=4.65)	1	14.2	1	11.7	1	9.74	1
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	12.4	1	0.438	1	0.477 (RPD=8.52)	1	0.959	1	1.22	1	0.991	1
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	0.220	1	0.446	1	0.447 (RPD=0.22)	1	0.721	1	0.802	1	0.440	1
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	5.40	1	2.11	1	2.14 (RPD=1.41)	1	3.95	1	4.48	1	4.92	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	2.20	1	1.40	1	1.38 (RPD=1.44)	1	1.11	1	0.114	1	1.35	1
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	1.15	1	1.05	1	1.08 (RPD=2.82)	1	1.19	1	1.75	1	1.26	1
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1

Comments:
 No problems noted. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **9/20/06**

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Technical Directive: **3ME353HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Analytes		Unit	ML 6-6		ML 2-2		ML 4-4		ML 4-6		FIELD BLANK		ML 5-6 DUP	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	5.26	1	16.5	1	43.5	1	2.40	1	ND	1
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	0.585	1	1.14	1	0.871	1	0.550	1	ND	1
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	0.300	1	0.730	1	0.427	1	0.387	1	0.411	1
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	ND	1
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	BQL(0.019)	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	3.56	1	5.49	1	4.76	1	3.01	1	ND	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.037	1	0.136	1	0.953	1	0.100	1	ND	1
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	2.38	1	1.58	1	1.33	1	1.25	1	0.548	1
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1	BQL(0.051)	1	ND	1	ND	1	BQL(0.031)	1

Comments:
 No problems noted. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

10/19/06

Technical Directive:

3GP924HW

Sample Results (1, 2)

Analyst:

Vanessa Scroggins

Analytes	Nitrite+Nitrate-Nitrogen(NO ₂ +NO ₃ -N)					
Codes	00630					
Methods	FIA 10-107-04-2-A					
Unit	mg/L					
MDL	0.009					
QL	0.100					
Date Analyzed	Data	DF	Data	DF	Data	DF
10/17/2006	BQL (0.041)	1				
10/17/2006	ND	1				
10/17/2006	BQL (0.029)	1				
10/17/2006	BQL (0.029) (RPD=NA)	1				
10/17/2006	BQL (0.029)	1				
10/17/2006	BQL (0.018)	1				
10/17/2006	BQL (0.023)	1				
10/17/2006	ND	1				
10/17/2006	BQL (0.031)	1				
10/17/2006	BQL (0.029) (RPD=NA)	1				

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set, that are within the calibration range.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable. **NA** - not applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **General Parameters** Report Date: **10/25/06**

Technical Directive: **3GP924HW**

Analyst: **Kristie Hargrove**

				Analytes		Total Inorganic Carbon (TIC)		Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)	
				Codes		7440-44-0-TIC		7440-44-0-TIC		7440-44-0-TOC	
				Methods		RSKSOP-265 Rev. 1		RSKSOP-265 Rev. 1		RSKSOP-265 Rev. 1	
				Unit		mg/L		mg/L		mg/L	
				MDL		0.473		0.011		0.020	
				QL		20.0		0.100		1.000	
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data		Data		DF	Data		DF
Field Blank	3572-1	10/5/2006	10/12-10/17/06	-		0.347 (± 0.1115)		1	BQL (0.181) (± 0.2184)		1
ML5-3	3572-2	10/5/2006	10/12-10/17/06	91.7 (± 0.1654)		-		-	52.0 (± 0.2984)		4
ML5-5	3572-3	10/5/2006	10/12-10/17/06	-		70.5 (± 0.0393)		4	19.6 (± 0.1932)		4
PMW-5	3572-4	10/5/2006	10/12-10/17/06	-		45.8 (± 0.1250)		4	33.5 (± 0.0549)		4
PMW-5	3572-4 LAB DUP	10/5/2006	10/12-10/17/06	-		45.9 (± 0.0874) (RPD=0.218)		4	33.7 (± 0.0600) (RPD=0.595)		4
ML2-3	3572-5	10/5/2006	10/12-10/17/06	107 (± 0.3726)		-		-	57.1 (± 0.6886)		4
ML2-5	3572-6	10/5/2006	10/12-10/17/06	-		65.4 (± 0.0819)		4	18.4 (± 0.0453)		4
DUP PMW-3	3572-7	10/10/2006	10/12-10/17/06	-		58.6 (± 0.1147)		4	29.2 (± 0.0920)		4
PMW-3	3572-8	10/10/2006	10/12-10/17/06	-		59.4 (± 0.0667)		4	24.4 (± 0.0956)		4

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set. The data values are reported with the dilution factors applied.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (**DF**), if applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

10/16/06

Technical Directive:

3GP924HW

Analyst:

Lynda Callaway

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Chloride (Cl)		Bromide (Br)		Nitrite-N (NO ₂ -N)		Sulfate (as SO ₄)		Nitrate-N (NO ₃ -N)		Fluoride (F)	
				Codes	16887-00-6	7726-95-6-BR		14797-65-0		14808-79-8		14797-55-8		7782-41-4	
				Methods	RSKSOP-288	RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288		RSKSOP-288	
				Unit	mg/L	mg/L		mg/L		mg/L		mg/L		mg/L	
				MDL	* 0.263	0.080		0.098		* 0.298		0.066		** 0.036	
				QL	* 1.00	1.00		0.200		* 1.00		0.200		0.100	
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Field Blank	3572-1	10/5/2006	10/12/2006	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
ML5-3	3572-2	10/5/2006	10/12/2006	153	11	BQL (0.710)	1	ND	1	95.4	11	ND	1	0.310	1
ML5-5	3572-3	10/5/2006	10/12/2006	39.9	1	BQL (0.957)	1	ND	1	50.2	11	ND	1	0.265	1
ML5-5	3572-3 Lab dup	10/5/2006	10/12/2006	39.8 (RPD=0.251)	1	BQL (0.939)(RPD=NA)	1	ND (RPD=NA)	1	52.7 (RPD=4.86)	11	ND (RPD=NA)	1	0.265 (RPD=0)	1
PMW-5	3572-4	10/5/2006	10/12/2006	124	11	1.07	1	ND	1	53.4	11	ND	1	0.146	1
ML2-3	3572-5	10/5/2006	10/12/2006	146	11	BQL (0.721)	1	ND	1	377	11	ND	1	0.299	1
ML2-5	3572-6	10/5/2006	10/12/2006	37.9	1	BQL (0.949)	1	ND	1	81.9	11	ND	1	0.260	1
Duplicate PMW-3	3572-7	10/10/2006	10/12/2006	77.3	11	BQL (0.995)	1	ND	1	43.3	1	ND	1	0.167	1
PMW-3	3572-8	10/10/2006	10/12/2006	77.9	11	1.04	1	ND	1	43.7	1	ND	1	0.105	1

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set within the calibration range. *MDL and QL should be raised by the same factor as the dilution factor for those samples that were diluted. ** A new MDL was established on 10/13/06 for fluoride with 0.100 mg/L as the quantitation limit.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all; NA means not applicable; NSF means not sufficient amount for analyses. All the results are corrected with dilution factors (DF), if applicable.

2. " -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

Report Date:

10/23/06

Page 1 of 2

Technical Directive:

3ME364HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Field Sample ID		FIELD BLANK	ML 5-3		ML 5-3		ML 5-5		ML 5-5		ML 5-5		PMW-5	
Sample Lab ID		3572-01	3572-02		3572-02 Lab Dup.*		3572-03		3572-03 Lab Dup.		3572-04		3572-04	
Date Collected		10/5/06	10/5/06		10/5/06		10/5/06		10/5/06		10/5/06		10/5/06	
Date Analyzed		10/17 & 10/18/06	10/17 & 10/18/06		10/17 & 10/18/06		10/17 & 10/18/06		10/17/06		10/17 & 10/18/06		10/17 & 10/18/06	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes													
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	ND	1	ND	1	ND (RPD=NA)	1	0.541	1	0.521 (RPD=3.77)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	ND	1	0.306	1	0.301 (RPD=1.65)	1	BQL(0.017)	1	BQL(0.016) (RPD=NA)	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	ND	1	0.334	1	0.335 (RPD=0.30)	1	0.209	1	0.208 (RPD=0.48)	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	ND	1	0.113	1	0.111 (RPD=1.79)	1	0.020	1	0.020 (RPD=0.00)	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	0.456	1	45.4	1	45.5 (RPD=0.22)	1	23.8	1	23.9 (RPD=0.42)	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	0.008	1	0.008 (RPD=0.00)	1	ND	1	ND (RPD=NA)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	ND	1	62.3	1	62.1 (RPD=0.32)	1	5.58	1	5.58 (RPD=0.00)	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	ND	1	1.02	1	1.05 (RPD=2.90)	1	1.21	1	1.22 (RPD=0.82)	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	ND	1	26.7	1	26.8 (RPD=0.37)	1	4.35	1	4.37 (RPD=0.46)	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	ND	1	0.161	1	0.162 (RPD=0.62)	1	0.150	1	0.150 (RPD=0.00)	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.001)	1	BQL(0.004)	1	0.005 (RPD=NA)	1	BQL(0.003)	1	BQL(0.002) (RPD=NA)	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	BQL(0.154)	1	114	1	113 (RPD=0.88)	1	102	1	103 (RPD=0.98)	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	BQL(0.011) (RPD=NA)	1	ND	1	ND (RPD=NA)	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1	BQL(0.005)	1	BQL(0.004) (RPD=NA)	1	ND	1	ND (RPD=NA)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.005)	1	BQL(0.008)	1	BQL(0.007) (RPD=NA)	1	BQL(0.006)	1	ND (RPD=NA)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.006)	1	ND	1	ND (RPD=NA)	1	BQL(0.007)	1	BQL(0.009) (RPD=NA)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	ND	1	0.368	1	0.364 (RPD=1.09)	1	0.225	1	0.227 (RPD=0.88)	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	0.014	1	0.015 (RPD=6.90)	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	ND	1	ND	1	ND (RPD=NA)	1	BQL(0.006)	1	ND (RPD=NA)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1	BQL(0.003)	1	BQL(0.004) (RPD=NA)	1	BQL(0.003)	1	ND (RPD=NA)	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	ND	1	ND (RPD=NA)	1	BQL(0.008)	1	BQL(0.008) (RPD=NA)	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	0.171	1	9.11	1	9.17 (RPD=0.66)	1	15.8	1	15.8 (RPD=0.00)	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND	1	29.8	1	30.2 (RPD=1.33)	1	17.5	1	17.5 (RPD=0.00)	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	BQL(0.017)	1	0.603	1	0.597 (RPD=1.00)	1	0.601	1	0.597 (RPD=0.67)	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND (RPD=NA)	1	ND	1	—	1

Comments:

The Analytical Sample Record listed a sample ML 2-5, but received two bottles labeled ML 2-3. Both samples were analyzed and designated as ML 2-3A and ML 2-3B. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. * -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:Metals

Report Date:10/23/06

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Technical Directive:3ME364HW

Sample Results (1, 2)

Analysts:S. Markham/S. Saye

Method:RSKSOP 213(2)

Analytes		Unit	Field Sample ID		PMW-5		ML 2-5		Duplicate PMW-3		PMW-3		ML 2-3			
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	—	—	ND	1	0.019	1	0.015	1	ND	1		
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	—	—	0.786	1	0.584	1	0.527	1	0.823	1		
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	—	—	BQL(0.012)	1	0.044	1	0.036	1	0.061	1		
Boron (B)	7440-42-8	mg/L	0.014	0.049	—	—	0.189	1	0.227	1	0.213	1	0.275	1		
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	—	—	0.018	1	0.053	1	0.046	1	0.091	1		
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	—	—	ND	1	ND	1	ND	1	ND	1		
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	—	—	20.6	1	18.3	1	17.1	1	65.6	1		
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	—	—	ND	1	BQL(0.002)	1	BQL(0.002)	1	BQL(0.002)	1		
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	—	—	ND	1	ND	1	ND	1	ND	1		
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	—	—	BQL(0.001)	1	ND	1	ND	1	ND	1		
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	—	—	ND	1	ND	1	ND	1	ND	1		
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	—	—	1.85	1	19.7	1	16.2	1	14.8	1		
Potassium (K)	7440-09-7	mg/L	0.061	0.204	—	—	1.22	1	15.1	1	16.1	1	2.01	1		
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	—	—	3.20	1	10.1	1	9.08	1	18.8	1		
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	—	—	0.080	1	0.071	1	0.066	1	0.283	1		
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	—	—	BQL(0.003)	1	BQL(0.001)	1	BQL(0.001)	1	0.005	1		
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	—	—	120	1	63.6	1	63.8	1	319	1		
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	—	—	ND	1	ND	1	ND	1	ND	1		
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	—	—	ND	1	ND	1	ND	1	ND	1		
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	—	—	BQL(0.007)	1	BQL(0.006)	1	BQL(0.005)	1	BQL(0.011)	1		
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	—	—	BQL(0.011)	1	BQL(0.009)	1	BQL(0.005)	1	0.017	1		
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	—	—	0.196	1	0.130	1	0.120	1	0.594	1		
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	—	—	0.024	1	0.017	1	0.014	1	0.029	1		
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	—	—	ND	1	ND	1	ND	1	BQL(0.017)	1		
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	—	—	BQL(0.002)	1	BQL(0.003)	1	ND	1	BQL(0.002)	1		
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	—	—	ND	1	ND	1	ND	1	BQL(0.018)	1		
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	—	—	16.2	1	14.9	1	15.1	1	12.3	1		
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	—	—	26.0	1	12.6	1	12.2	1	124	1		
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	—	—	1.47	1	0.921	1	0.964	1	0.171	1		
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND (RPD=NA)		ND	1	ND	1	ND	1	ND	1		

Comments:

The Analytical Sample Record listed a sample ML 2-5, but received two bottles labeled ML 2-3. Both samples were analyzed and designated as ML 2-3A and ML 2-3B. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

- Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 10/23/06

Technical Directive: 3ME364HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 257(1)

Analysts:	S. Markham/S. Saye						Field Sample ID		FIELD BLANK		ML 5-3		ML 5-5		PMW-5		PMW-5		PMW-5	
	RSKOP 257(1)						Sample Lab ID		3572-01		3572-02		3572-03		3572-04		3572-04 Lab Dup.		3572-04 Lab Dup.*	
							Date Collected		10/5/06		10/5/06		10/5/06		10/5/06		10/5/06		10/5/06	
							Date Analyzed		10/17, 10/18 & 10/19/06		10/17, 10/18 & 10/19/06		10/17, 10/18 & 10/19/06		10/17, 10/18 & 10/19/06		10/17, 10/18 & 10/19/06		10/17, 10/18 & 10/19/06	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF				
Names	Codes																			
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	ND	1	294	5	12.6	5	40.9	5	41.0 (RPD=0.24)	5	41.1 (RPD=0.49)	5				
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	0.410	1	2.58	1	2.24	1	1.63	1	1.58 RPD=3.12)	1	2.54 (RPD=43.65)	1				
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	BQL(0.078)	1	2.96	1	0.920	1	1.14	1	1.16 (RPD=1.74)	1	1.13 (RPD=0.88)	1				
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	6.84	1	—	—	—	—	—	—	—	—	—	—				
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	0.114	1	0.214	1	0.484	1	0.445	1	0.443 (RPD=0.45)	1	0.300 (RPD=38.93)	1				
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	0.052	1	9.73	5	10.9	5	12.2	5	11.7 (RPD=4.18)	5	12.5 (RPD=2.43)	5				
Uranium (U)	7440-61-1	µg/L	0.002	0.008	ND	1	0.540	5	0.220	5	0.240	5	0.245 (RPD=2.06)	5	0.245 (RPD=2.06)	5				
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	0.836	1	9.30	5	7.15	5	7.64	5	7.07 (RPD=7.75)	5	6.77 (RPD=12.07)	5				
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	1	BQL(0.049)	1	ND	1	ND	1	ND (RPD=NA)	1	ND (RPD=NA)	1				

Comments:
The Analytical Sample Record listed a sample ML 2-5, but received two bottles labeled ML 2-3. Both samples were analyzed and designated as ML 2-3A and ML 2-3B. Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **10/23/06**

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Technical Directive: **3ME364HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Analysts:	S. Markham/S. Saye		ML 2-3A renamed to ML 2-3						ML 2-3B renamed to ML 2-5								
			Field Sample ID		ML 2-3		Duplicate PMW-3		PMW-3		ML 2-5						
			Sample Lab ID		3572-05		3572-07		3572-08		3572-11						
			Date Collected		10/5/06		10/10/06		10/10/06		10/5/06						
Method:	RSKSOP 257(1)				Date Analyzed		10/17, 10/18 & 10/19/06		10/17, 10/18 & 10/19/06		10/17, 10/18 & 10/19/06		10/17, 10/18 & 10/19/06				
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes																
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	5.66	5	38.8	5	31.2	5	51.9	5					
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	3.30	1	3.26	1	2.69	1	4.41	1					
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	0.885	1	0.979	1	0.992	1	1.91	1					
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—					
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	0.387	1	0.455	1	0.347	1	1.87	1					
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	11.0	5	10.8	5	10.7	5	9.29	5					
Uranium (U)	7440-61-1	µg/L	0.002	0.008	1.86	5	0.130	5	0.120	5	2.11	5					
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	6.06	5	7.24	5	7.00	5	12.5	5					
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	1	BQL(0.034)	1	ND	1	ND	1					

Comments:
 The Analytical Sample Record listed a sample ML 2-5, but received two bottles labeled ML 2-3. Both samples were analyzed and designated as ML 2-3A and ML 2-3B. Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **10/23/06**

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Technical Directive: **3ME365HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

ML 2-3A renamed to ML 2

Analytes		Unit	MDL	QL	FIELD BLANK		ML 5-3		ML 5-3		ML 5-5		PMW-5		ML 2-3	
Names	Codes				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	ND	1	363	5	359 (RPD=1.11)	5	15.6	1	58.4	1	70.2	1
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	BQL(0.190)	1	2.98	5	2.75 (RPD=8.03)	5	2.74	5	3.89	5	5.60	5
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	ND	1	0.478	1	0.456 (RPD=4.71)	1	BQL(0.070)	1	0.354	1	0.586	1
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	3.86	1	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	BQL(0.235)	1	6.62	1	6.50 (RPD=1.83)	1	6.32	1	6.50	1	6.89	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND	1	0.628	1	0.626 (RPD=0.32)	1	0.096	1	0.257	1	2.28	1
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	BQL(0.115)	1	2.39	1	2.40 (RPD=0.42)	1	0.871	1	5.03	1	2.99	1
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	BQL(0.068)	1	BQL(0.061)	1	BQL(0.053) (RPD=NA)	1	BQL(0.044)	1	BQL(0.045)	1	ND	1

Comments:

For the analysis of chromium, samples were diluted five-fold to reduce the interference of the polyatomic species ArC at mass 52. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **10/23/06**

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Technical Directive: **3ME365HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Field Sample ID	2-3 Duplicate PMW-3		ML 2-3B renamed to ML 2-5 PMW-3		ML 2-5			
	3573-07		3573-08		3573-11			
	10/10/06		10/10/06		10/5/06			
	10/16 & 10/17/06		10/16 & 10/17/06		10/16 & 10/17/06			

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	64.0	1	61.4	1	6.87	1						
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	5.30	5	3.54	5	3.50	5						
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	0.200	1	0.158	1	BQL(0.033)	1						
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—						
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND	1						
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	5.55	1	5.50	1	5.24	1						
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.025	1	0.021	1	0.585	1						
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	1.98	1	1.70	1	1.14	1						
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	BQL(0.044)	1	ND	1	ND	1						

Comments:
 For the analysis of chromium, samples were diluted five-fold to reduce the interference of the polyatomic species ArC at mass 52. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

Report Date:

10/19/06

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Technical Directive:

3ME365HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

ML 2-3A renamed to ML

Analytes		Unit	MDL		Data		DF	Data		DF	Data		DF	Data		DF	Data		DF
Names	Codes																		
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1		ND	1		ND (RPD=NA)	1		ND	1		ND	1	
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1		ND	1		ND (RPD=NA)	1		ND	1		ND	1	
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	ND	1		0.406	1		0.406 (RPD=0.00)	1		0.027	1		0.081	1	
Boron (B)	7440-42-8	mg/L	0.013	0.044	ND	1		0.364	1		0.363 (RPD=0.28)	1		0.210	1		0.231	1	
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	ND	1		0.117	1		0.116 (RPD=0.86)	1		0.019	1		0.077	1	
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1		ND	1		ND (RPD=NA)	1		ND	1		ND	1	
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	0.434	1		44.6	1		44.7 (RPD=0.22)	1		23.1	1		59.3	1	
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1		0.010	1		0.010 (RPD=0.00)	1		ND	1		BQL(0.003)	1	
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1		BQL(0.002)	1		BQL(0.001) (RPD=NA)	1		ND	1		ND	1	
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1		ND	1		ND (RPD=NA)	1		ND	1		ND	1	
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1		ND	1		ND (RPD=NA)	1		ND	1		ND	1	
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	ND	1		72.7	1		72.8 (RPD=0.14)	1		5.64	1		18.4	1	
Potassium (K)	7440-09-7	mg/L	0.055	0.184	ND	1		1.06	1		1.04 (RPD=1.90)	1		1.19	1		6.07	1	
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	ND	1		26.3	1		26.3 (RPD=0.00)	1		4.26	1		9.64	1	
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	ND	1		0.160	1		0.159 (RPD=0.63)	1		0.145	1		0.193	1	
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1		0.005	1		0.005 (RPD=0.00)	1		BQL(0.002)	1		0.004	1	
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	0.153	1		113	1		112 (RPD=0.89)	1		99.7	1		63.6	1	
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1		ND	1		ND (RPD=NA)	1		ND	1		ND	1	
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1		BQL(0.006)	1		BQL(0.005) (RPD=NA)	1		ND	1		ND	1	
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	ND	1		BQL(0.004)	1		BQL(0.008) (RPD=NA)	1		ND	1		BQL(0.008)	1	
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	ND	1		ND	1		ND (RPD=NA)	1		0.010	1		0.025	1	
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	ND	1		0.364	1		0.363 (RPD=0.28)	1		0.219	1		0.256	1	
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1		ND	1		ND (RPD=NA)	1		ND	1		ND	1	
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1		BQL(0.007)	1		BQL(0.008) (RPD=NA)	1		BQL(0.012)	1		0.023	1	
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	ND	1		BQL(0.002)	1		ND (RPD=NA)	1		ND	1		ND	1	
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1		ND	1		ND (RPD=NA)	1		ND	1		ND	1	
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	BQL(0.135)	1		9.31	1		9.33 (RPD=0.21)	1		15.5	1		14.6	1	
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	ND	1		32.1	1		32.2 (RPD=0.31)	1		18.7	1		20.6	1	
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	ND	1		0.689	1		0.689 (RPD=0.00)	1		0.683	1		0.885	1	
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1		ND	1		ND (RPD=NA)	1		ND	1		ND	1	

Comments:

The Analytical Sample Record listed a sample ML 2-5, but received two bottles labeled ML 2-3. Both samples were analyzed and designated as ML 2-3A and ML 2-3B. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
- " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

Report Date:

10/19/06

Page 2 of 2

Technical Directive:

3ME365HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

2-3

ML 2-3B renamed to ML 2-5

Analytes		Unit	MDL	QL	Duplicate PMW-3		PMW-3		ML 2-5		Data	DF	Data	DF	Data	DF
Names	Codes				Data	DF	Data	DF	Data	DF						
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1						
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND	1	ND	1						
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.085	1	0.077	1	0.027	1						
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.242	1	0.238	1	0.192	1						
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.061	1	0.059	1	0.018	1						
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1						
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	18.7	1	18.4	1	20.1	1						
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.003)	1	ND	1						
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1						
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1						
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1						
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	24.4	1	23.6	1	1.73	1						
Potassium (K)	7440-09-7	mg/L	0.055	0.184	14.1	1	14.3	1	1.17	1						
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	10.7	1	10.3	1	3.09	1						
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.071	1	0.070	1	0.078	1						
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.002)	1	0.004	1						
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	63.3	1	62.8	1	118	1						
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1						
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	ND	1	ND	1						
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	ND	1	BQL(0.004)	1	BQL(0.005)	1						
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	0.016	1	0.016	1	0.023	1						
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.135	1	0.131	1	0.192	1						
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND	1						
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.006)	1	ND	1	BQL(0.011)	1						
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	BQL(0.003)	1	ND	1	ND	1						
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	ND	1	ND	1						
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	14.0	1	14.1	1	15.0	1						
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	13.8	1	13.9	1	27.4	1						
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	1.25	1	1.27	1	1.71	1						
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1						

Comments:

The Analytical Sample Record listed a sample ML 2-5, but received two bottles labeled ML 2-3. Both samples were analyzed and designated as ML 2-3A and ML 2-3B. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
- * -* denotes that the information is not available or the analyte is not analyzed.

Client : EPA
Project : Paris Island/Nano Iron for Source Zones
Number/Type of Samples : 7 water samples
Analysis Required : d13C of Chlorinated C2 cpds
Date Received: : 11 October 2006
Date Analysis Completed : 18 November 2006

Notes: na/nd—peak not acquired (above quantitation limit, if so the sample was rerun with higher dilution x) or compound not detected
 coel – GC coelution

Replicate Runs

Run #	Sample ID	Dilution x	d13C			
			1,1DCE	cis-DCE	TCE	PCE
0519	ML2-3	25000	na/nd	-29.3	na/nd	na/nd
0515	ML2-3	12500	na/nd	na/nd	-27.1	na/nd
0527	ML2-3	4167	na/nd	na/nd	-27.4	-26.1
0531	ML2-3	89	-35.2	na/nd	na/nd	na/nd
0516	ML2-5	50000	na/nd	na/nd	na/nd	-27.6
0529	ML2-5	1389	na/nd	-32.0	-32.3	na/nd
0537	ML2-5	3	-40.5	na/nd	na/nd	na/nd
0512	ML5-3	25000	na/nd	-28.4	na/nd	na/nd
0521	ML5-3	556	na/nd	na/nd	-18.3	na/nd
0534	ML5-3	19	coel	na/nd	na/nd	-18.8
0522	ML5-5	8333	na/nd	-29.0	na/nd	na/nd
0513	ML5-5	1923	na/nd	na/nd	-26.7	-25.8
0535	ML5-5	10	-37.1	na/nd	na/nd	na/nd
0510	PMW-3	12500	na/nd	-27.6	na/nd	-27.2
0520	PMW-3	1667	na/nd	na/nd	-31.3	na/nd
0566	PMW-3	13	coel	na/nd	na/nd	na/nd
0523	PMW-5	8333	na/nd	-28.4	-31.0	-27.1
0524	PMW-5	8333	na/nd	-28.0	-30.8	-26.8
0536	PMW-5	10	coel	na/nd	na/nd	na/nd
0517	DUPLICATE (PMW-3)	25000	na/nd	-27.3	na/nd	na/nd
0526	DUPLICATE (PMW-3)	4167	na/nd	-27.6	-31.0	-27.1
0533	DUPLICATE (PMW-3)	53	coel	na/nd	na/nd	na/nd
0567	DUPLICATE (PMW-3)	13	coel	na/nd	na/nd	na/nd

Averages

Sample ID	d13C			
	1,1DCE	cis-DCE	TCE	PCE
ML2-3	-35.2	-29.3	-27.3	-26.1
ML2-5	-40.5	-32.0	-32.3	-27.6
ML5-3	coel	-28.4	-18.3	-18.8
ML5-5	-37.1	-29.0	-26.7	-25.8
PMW-3	coel	-27.6	-31.3	-27.2
PMW-5	coel	-28.2	-30.9	-27.0
DUPLICATE (PMW-3)	coel	-27.5	-31.0	-27.1

QAQC – precision

Sample ID	StDev of replicate d13C			
	1,1DCE	cis-DCE	TCE	PCE
ML2-3			0.2	
ML2-5				
ML5-3				
ML5-5				
PMW-3				
PMW-5		0.3	0.1	0.2
DUPLICATE (PMW-3)		0.2		

Client : EPA
 Project : Paris Island/Nano Iron for Source Zones
 Number/Type of Samples : 7 water samples
 Analysis Required : d13C of ethane, ethene, VC
 Date Received: : 11 October 2006
 Date Analysis Completed : 17 November 2006

Notes: na/nd–peak not acquired (above quantitation limit, if so the sample was rerun with higher dilution x) or compound not detected

Replicate Runs

run #	sample ID	dilution x	d13C		
			ethene	ethane	VC
5253	ML2-3	31	-29.9	na/nd	-31.0
5257	ML2-3	63	-29.5	na/nd	-31.3
5266	ML2-3	1	na/nd	-29.4	na/nd
5254	ML2-5	5	na/nd	na/nd	-27.9
5248	ML5-3	313	-29.6	na/nd	-38.1
5258	ML5-3	250	-29.5	na/nd	-37.4
5272	ML5-3		na/nd	-37.1	na/nd
5251	ML5-5	19	na/nd	na/nd	-36.8
5255	ML5-5	17	-28.6	na/nd	-37.1
5264	ML5-5	1	-28.9	na/nd	na/nd
5245	PMW-3	36	-29.1	na/nd	na/nd
5247	PMW-3	357	na/nd	na/nd	-39.1
5268	PMW-3	1	na/nd	-36.0	na/nd
5252	PMW-5	7	-31.0	na/nd	-27.6
5270	PMW-5	1	-30.6	-37.0	na/nd
5265	DUPLICATE (PMW-3)	250	na/nd	na/nd	-39.0
5267	DUPLICATE (PMW-3)	83	-29.3	na/nd	-39.2
5269	DUPLICATE (PMW-3)	1	na/nd	-34.5	na/nd

Averages

sample ID	d13C		
	ethene	ethane	VC
ML2-3	-29.7	-29.4	-31.2
ML2-5	nd	nd	-27.9
ML5-3	-29.6	-37.1	-37.8
ML5-5	-28.8	nd	-37.0
PMW-3	-29.1	-36.0	-39.1
PMW-5	-30.8	-37.0	-27.6
DUPLICATE (PMW-3)	-29.3	-34.5	-39.1

QAQC – precision

sample ID	stdev of replicate d13C		
	ethene	ethane	VC
ML2-3	0.3		0.2
ML2-5			
ML5-3	0.1		0.5
ML5-5	0.2		0.2
PMW-3			
PMW-5	0.3		
DUPLICATE (PMW-3)			0.1

tbl_Temp

OurLabID	Sample ID	Delta 37Cl	State Code	Country Code
J-420	ML 5-3	4.43	0	US
J-421	ML 5-5	4.29	0	US
J-422	PMW-5	3.46	0	US
J-423	ML 2-3	3.99	0	US
J-424	ML 2-5	2.57	0	US
J-425	Duplicate (PMW-3)	4.32	0	US
J-426	PMW-3	3.29	0	US

Analytical Report - Analytical Results

Laboratory: IRMS

Report Date: 11/30/06

Tech Dir: 3OA895HW

Date Analyzed: 11/6-16/2006

Method: RSKSOP-296 in Progress

Date Received: 10/30/06

Analyst: Feng Lu

Field Sample ID	IRMS Tracking ID	Lab ID	1000 $\delta^2\text{H}_{\text{VSMOW}}$			1000 $\delta^{18}\text{O}_{\text{VSMOW}}$		
			Measured	Mean	Stdev	Measured	Mean	Stdev
ML2-3 (10/5/06)	3592-014	3592-3	-19.73			-3.87		
	3592-015	3592-3D	-16.18			-2.80		
	3592-016	3592-3D	-17.93			-3.24		
	3592-017	3592-3D	-17.86			-2.92		
	3592-018	3592-3D	-16.82			-3.01		
	3592-019	3592-3D	-16.55	-16.69	0.19	-3.09	-3.05	0.06
ML2-5 (10/5/06)	3592-020	3592-4	-16.17			-2.59		
	3592-021	3592-4D	-15.98			-3.06		
	3592-022	3592-4D	-16.42			-3.17		
	3592-023	3592-4D	-17.15	-16.78	0.52	-2.98	-3.08	0.14
ML5-3 (10/5/06)	3592-024	3592-5	-17.69			-3.25		
	3592-025	3592-5D	-16.49			-3.05		
	3592-026	3592-5D	-16.84			-2.91		
	3592-027	3592-5D	-16.46	-16.65	0.27	-2.89	-2.90	0.01
ML5-5 (10/5/06)	3592-028	3592-6	-14.76			-2.95		
	3592-029	3592-6D	-15.13			-2.90		
	3592-030	3592-6D	-16.39			-2.92		
	3592-031	3592-6D	-15.62	-16.01	0.55	-2.90	-2.91	0.01
PMW-5 (10/5/06)	3592-032	3592-7	-16.22			-3.35		
	3592-033	3592-7D	-15.62			-3.08		
	3592-034	3592-7D	-16.06			-2.93		
	3592-035	3592-7D	-15.98	-16.02	0.06	-2.91	-2.92	0.02
PMW-3 (10/10/06)	3592-036	3592-8	-16.79			-3.28		
	3592-037	3592-8D	-15.59			-2.79		
	3592-038	3592-8D	-15.73			-2.98		
	3592-039	3592-8D	-16.07	-15.90	0.24	-3.02	-3.00	0.03
PMW-3 dup (10/10/06)	3592-040	3592-9	-16.29			-3.12		
	3592-041	3592-9D	-16.53			-2.96		
	3592-042	3592-9D	-15.75			-2.98		
	3592-043	3592-9D	-16.17	-15.96	0.30	-2.96	-2.97	0.02

Comments:

Due to memory effect, typically the first one to four replicates (italic) of each sample were excluded from the calculations for the average (mean) and the standard deviation (stdev).

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

12/20/06

Technical Directive:

3GP940HW

Sample Results (1, 2)

Analyst:

Vanessa Scroggins

Analytes	Nitrite+Nitrate-Nitrogen(NO ₂ +NO ₃ -N)		
Codes	00630		
Methods	FIA 10-107-04-2-A		
Unit	mg/L		
MDL	0.009		
QL	0.100		

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF
FIELD BLANK	3644-1	11/29/2006	12/7/2006	BQL (0.032)	1				
PMW-3	3644-2	11/29/2006	12/7/2006	BQL (0.041)	1				
ML6-3	3644-3	11/29/2006	12/7/2006	ND	1				
ML6-3	3644-3 LAB DUP	11/29/2006	12/7/2006	ND (RPD=NA)	1				
ML6-5	3644-4	11/29/2006	12/7/2006	ND	1				
ML6-7	3644-5	11/29/2006	12/7/2006	BQL (0.040)	1				
ML5-3	3644-6	11/29/2006	12/7/2006	BQL (0.017)	1				
ML5-5	3644-7	11/29/2006	12/7/2006	BQL (0.063)	1				
ML5-7	3644-8	11/29/2006	12/7/2006	BQL (0.024)	1				
ML4-3	3644-9	11/29/2006	12/7/2006	ND	1				
ML4-5	3644-10	11/29/2006	12/7/2006	BQL (0.023)	1				
ML4-5	3644-10 LAB DUP	11/29/2006	12/7/2006	BQL (0.024) (RPD=NA)	1				
DUPLICATE-1 (ML5-5)	3644-11	11/29/2006	12/7/2006	BQL (0.057)	1				
ML4-7	3644-12	11/30/2006	12/7/2006	BQL (0.051)	1				
PMW-2	3644-13	11/30/2006	12/7/2006	BQL (0.040)	1				
ML1-3	3644-14	11/30/2006	12/7/2006	BQL (0.017)	1				
ML1-5	3644-15	11/30/2006	12/7/2006	BQL (0.028)	1				
ML1-7	3644-16	11/30/2006	12/7/2006	BQL (0.021)	1				
PMW-1	3644-17	11/30/2006	12/7/2006	BQL (0.040)	1				
PMW-4	3644-18	12/1/2006	12/7/2006	BQL (0.030)	1				
ML2-3	3644-19	12/1/2006	12/7/2006	ND	1				
ML2-5	3644-20	12/1/2006	12/7/2006	BQL (0.039)	1				
ML2-7	3644-21	12/2/2006	12/7/2006	BQL (0.017)	1				
ML2-7	3644-21 LAB DUP	12/2/2006	12/7/2006	BQL (0.012) (RPD=NA)	1				
PMW-5	3644-22	12/2/2006	12/7/2006	ND	1				
PMW-6	3644-23	12/2/2006	12/7/2006	BQL (0.021)	1				
DUPLICATE-2 (PMW-5)	3644-24	12/2/2006	12/7/2006	ND	1				

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

12/20/06

Technical Directive:

3GP940HW

Sample Results (1, 2)

Analyst:

Vanessa Scroggins

Analytes	Nitrite+Nitrate-Nitrogen(NO ₂ +NO ₃ -N)		
Codes	00630		
Methods	FIA 10-107-04-2-A		
Unit	mg/L		
MDL	0.009		
QL	0.100		

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF
ML7-3	3644-25	12/2/2006	12/7/2006	BQL (0.039)	1				
ML7-5	3644-26	12/4/2006	12/7/2006	BQL (0.040)	1				
ML7-7	3644-27	12/4/2006	12/7/2006	BQL (0.010)	1				
ML3-3	3644-28	12/4/2006	12/7/2006	BQL (0.065)	1				
ML3-5	3644-29	12/4/2006	12/7/2006	BQL (0.057)	1				
ML3-5	3644-29 LAB DUP	12/4/2006	12/7/2006	BQL (0.055) (RPD=NA)	1				
ML3-7	3644-30	12/4/2006	12/7/2006	BQL (0.052)	1				

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set, that are within the calibration range.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable. **NA** - not applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

12/19/06

Technical Directive:

3GP940HW

Analyst:

Kristie Hargrove

Analyst: Kristie Hargrove			Analytes	Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)	
			Codes	7440-44-0-TIC		7440-44-0-TOC	
			Methods	RSKSOP-265 Rev. 1		RSKSOP-265 Rev. 1	
			Unit	mg/L		mg/L	
			MDL	0.018**		0.062**	
			QL	0.100**		0.100**	
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF
Field Blank	3644-1	11/29/2006	12/7-12/18/06	0.642 (± 0.0020)	4	BQL (0.066) (± 0.0106)	1
PMW-3	3644-2	11/29/2006	12/7-12/18/06	37.6 (± 0.1109)	4	16.5 (± 0.0028)	4
ML 6-3	3644-3	11/29/2006	12/7-12/18/06	66.8 (± 0.0221)	10	43.9 (± 0.0649)	4
ML 6-5	3644-4	11/29/2006	12/7-12/18/06	44.2 (± 0.0447)	4	43.9 (± 0.0121)	4
ML 6-7	3644-5	11/29/2006	12/7-12/18/06	75.7(± 0.0299)	10	29.0 (± 0.1108)	4
ML 5-3	3644-6	11/29/2006	12/7-12/18/06	76.1(± 0.0928)	4	60.5 (± 0.5175)	4
ML 5-5	3644-7	11/29/2006	12/7-12/18/06	52.4 (± 0.0268)	4	89.0 (± 0.0458)*	10
ML 5-7	3644-8	11/29/2006	12/7-12/18/06	65.1 (± 0.0631)	4	80.9 (± 0.0172)*	10
ML 4-3	3644-9	11/29/2006	12/7-12/18/06	69.0 (± 0.1383)	4	41.1 (± 0.1547)	4
ML 4-5	3644-10	11/29/2006	12/7-12/18/06	53.1 (± 0.0805)	4	12.0 (± 0.1673)	4
ML 4-5	3644-10 LAB DUP	11/29/2006	12/7-12/18/06	49.3 (± 0.1182) (RPD = 7.42)	4	11.6 (± 0.0197) (RPD=3.39)	4
DUPLICATE 1 (ML 5-5)	3644-11	11/29/2006	12/7-12/18/06	52.5 (± 0.1313)	4	91.2 (± 0.0444)*	10
ML 4-7	3644-12	11/30/2006	12/7-12/18/06	77.7 (± 0.0358)	10	26.7 (± 0.1535)	4
PMW-2	3644-13	11/30/2006	12/7-12/18/06	51.5 (± 0.1641)	4	17.8 (± 0.0840)	4
ML 1-3	3644-14	11/30/2006	12/7-12/18/06	114 (± 0.0804)	10	72.3 (± 0.4035)	4
ML 1-5	3644-15	11/30/2006	12/7-12/18/06	110 (± 0.0599)	10	44.9 (± 0.2650)	4
ML 1-7	3644-16	11/30/2006	12/7-12/18/06	70.1 (± 0.1609)	4	22.5 (± 0.1130)	4
PMW-1	3644-17	11/30/2006	12/7-12/18/06	45.5 (± 0.2290)	4	145 (± 0.1905)*	10
PMW-4	3644-18	12/1/2006	12/7-12/18/06	44.1 (± 0.1897)	4	29.0 (± 0.1766)	4
ML 2-3	3644-19	12/1/2006	12/7-12/18/06	14.7 (± 0.0707)	4	818 (± 0.0608)*	80
ML 2-5	3644-20	12/1/2006	12/7-12/18/06	49.4 (± 0.1106)	4	20.6 (± 0.0723)	4
ML 2-5	3644-20 LAB DUP	12/1/2006	12/7-12/18/06	47.7 (± 0.2264) (RPD = 3.50)	4	20.7 (± 0.0283) (RPD=0.484)	4
ML 2-7	3644-21	12/2/2006	12/7-12/18/06	83.3 (± 0.0556)	10	18.0 (± 0.1277)	4
PMW-5	3644-22	12/2/2006	12/7-12/18/06	30.8 (± 0.0294)	4	78.5 (± 0.1828)*	10
PMW-6	3644-23	12/2/2006	12/7-12/18/06	55.0 (± 0.0715)	4	50.6 (± 0.0410)	4
DUPLICATE 2 (PMW-5)	3644-24	12/2/2006	12/7-12/18/06	29.1 (± 0.0734)	4	77.9 (± 0.0611)*	10

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: General Parameters

Report Date: 12/19/06

Technical Directive: 3GP940HW

Analyst: Kristie Hargrove

Analyst: Kristie Hargrove			Analytes	Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)	
			Codes	7440-44-0-TIC		7440-44-0-TOC	
			Methods	RSKSOP-265 Rev. 1		RSKSOP-265 Rev. 1	
			Unit	mg/L		mg/L	
			MDL	0.018**		0.062**	
			QL	0.100**		0.100**	
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF
ML 7-3	3644-25	12/2/2006	12/7-12/18/06	114 (± 0.0505)	10	224 (± 0.3584)*	10
ML 7-5	3644-26	12/4/2006	12/7-12/18/06	51.7 (± 0.0581)	4	110 (± 0.4389)*	10
ML 7-7	3644-27	12/4/2006	12/7-12/18/06	85.9 (± 0.0461)	10	54.2 (± 0.0132)*	10
ML 3-3	3644-28	12/4/2006	12/7-12/18/06	1.66 (± 0.0393)	4	1090 (± 0.0790)*	80
ML 3-3	3644-28 LAB DUP	12/4/2006	12/7-12/18/06	1.66 (± 0.0031) (RPD=0)	4	-	-
ML 3-5	3644-29	12/4/2006	12/7-12/18/06	13.0 (± 0.0259)	4	432 (± 0.0482)*	80
ML 3-7	3644-30 LAB DUP	12/4/2006	12/7-12/18/06	-	-	329 (± 0.2081)*	20
ML 3-7	3644-30	12/4/2006	12/7-12/18/06	26.9 (± 0.0403)	4	343 (± 0.1436)* (RPD=4.17)	20

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set. The data values are reported with the dilution factors applied.

Notes:

* This data is flagged because the samples contain vegetable oil at concentrations that may cause a positive bias for TOC.

** The MDL and QL should be raised by the same factor as the dilution factor in the samples that were diluted.

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all; NA means not applicable; NSF means not sufficient amount for analyses. All the results are corrected with dilution factors (DF), if applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **General Parameters** Report Date: **12/19/06**

Technical Directive: **3GP940HW**

Analyst: **Lynda Callaway**

Analytes	Chloride (Cl)	Bromide (Br)	Nitrite-N (NO ₂ -N)	Sulfate (as SO ₄)	Nitrate-N (NO ₃ -N)	Fluoride (F)
Codes	16887-00-6	7726-95-6-BR	14797-65-0	14808-79-8	14797-55-8	7782-41-4
Methods	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288
Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MDL	* 0.249	0.200	0.102	* 0.422	0.102	0.106
QL	* 1.00	0.500	0.200	* 1.00	0.200	0.200

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Field Blank	3644-1	11/29/2006	12/7/2006	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
PMW-3	3644-2	11/29/2006	12/7/2006	45.1	11	0.978	1	ND	1	28.0	11	ND	1	ND	1
ML6-3	3644-3	11/29/2006	12/7/2006	108	11	0.718	1	ND	1	61.5	11	ND	1	BQL (0.196)	1
ML6-5	3644-4	11/29/2006	12/7/2006	112	11	1.12	1	ND	1	21.2	1	ND	1	ND	1
ML6-7	3644-5	11/29/2006	12/7/2006	115	11	0.740	1	ND	1	68.2	11	ND	1	0.340	1
ML5-3	3644-6	11/29/2006	12/7/2006	169	11	0.506	1	ND	1	65.9	11	ND	1	0.305	1
ML5-5	3644-7	11/29/2006	12/7/2006	56.1	11	1.11	1	ND	1	11.3	1	ND	1	BQL (0.119)	1
ML5-7	3644-8	11/29/2006	12/7/2006	68.3	11	0.749	1	ND	1	29.2	1	ND	1	0.323	1
ML4-3	3644-9	11/29/2006	12/7/2006	97.0	11	0.822	1	ND	1	27.8	1	ND	1	0.200	1
ML4-5	3644-10	11/29/2006	12/7/2006	38.1	1	0.745	1	ND	1	47.2	1	ND	1	BQL (0.123)	1
ML4-5	3644-10 Lab dup	11/29/2006	12/7/2006	37.8 (RPD=0.791)	1	0.744 (RPD=0.134)	1	ND (RPD=NA)	1	46.1 (RPD=2.36)	1	ND (RPD=NA)	1	BQL (0.134)(RPD=NA)	1
Duplicate-1 (ML5-5)	3644-11	11/29/2006	12/7/2006	56.2	11	0.862	1	ND	1	11.7	1	ND	1	BQL (0.123)	1
ML4-7	3644-12	11/30/2006	12/7/2006	65.4	11	0.523	1	ND	1	27.0	1	ND	1	0.244	1
PMW-2	3644-13	11/30/2006	12/7/2006	40.6	1	0.639	1	ND	1	69.3	11	ND	1	ND	1
ML1-3	3644-14	11/30/2006	12/7/2006	106	11	0.690	1	ND	1	204	11	ND	1	0.340	1
ML1-5	3644-15	11/30/2006	12/7/2006	47.0	1	0.822	1	ND	1	94.2	11	ND	1	0.391	1
ML1-7	3644-16	11/30/2006	12/7/2006	111	11	BQL (0.460)	1	ND	1	118	11	ND	1	0.258	1
PMW-1	3644-17	11/30/2006	12/7/2006	48.9	1	ND	1	ND	1	18.9	1	ND	1	ND	1
PMW-4	3644-18	12/1/2006	12/7/2006	72.6	11	0.848	1	ND	1	101	11	ND	1	ND	1
ML2-3	3644-19	12/1/2006	12/7/2006	584	21	** ND	11	** ND	11	1.98	1	ND	1	BQL (0.164)	1
ML2-5	3644-20	12/1/2006	12/7/2006	34.9	1	BQL (0.432)	1	ND	1	45.2	1	ND	1	0.258	1
ML2-5	3644-20 Lab dup	12/1/2006	12/7/2006	34.8 (RPD=0.287)	1	BQL (0.443)(RPD=NA)	1	ND (RPD=NA)	1	45.3 (RPD=0.221)	1	ND (RPD=NA)	1	0.234 (RPD=9.76)	1
ML2-7	3644-21	12/2/2006	12/7/2006	94.8	11	BQL (0.376)	1	ND	1	103	11	ND	1	0.442	1
PMW-5	3644-22	12/2/2006	12/7/2006	134	11	0.846	1	ND	1	4.56	1	ND	1	ND	1
PMW-6	3644-23	12/2/2006	12/7/2006	49.1	1	0.514	1	ND	1	23.7	1	ND	1	ND	1
Duplicate 2 (PMW-5)	3644-24	12/2/2006	12/7/2006	130	11	0.844	1	ND	1	4.96	1	ND	1	ND	1
ML7-3	3644-25	12/2/2006	12/7/2006	175	11	1.12	1	ND	1	71.2	11	ND	1	0.393	1
ML7-5	3644-26	12/4/2006	12/7/2006	64.5	11	1.03	1	ND	1	1.86	1	ND	1	BQL (0.181)	1
ML7-7	3644-27	12/4/2006	12/7/2006	87.9	11	0.758	1	ND	1	23.5	1	ND	1	0.519	1

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

12/19/06

Technical Directive:

3GP940HW

Analyst:

Lynda Callaway

Analytes	Chloride (Cl)	Bromide (Br)	Nitrite-N (NO ₂ -N)	Sulfate (as SO ₄)	Nitrate-N (NO ₃ -N)	Fluoride (F)
Codes	16887-00-6	7726-95-6-BR	14797-65-0	14808-79-8	14797-55-8	7782-41-4
Methods	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288
Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MDL	* 0.249	0.200	0.102	* 0.422	0.102	0.106
QL	* 1.00	0.500	0.200	* 1.00	0.200	0.200

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
ML3-3	3644-28	12/4/2006	12/7/2006	112	11	0.988	1	ND	1	ND	1	ND	1	0.445	1
ML3-5	3644-29	12/4/2006	12/7/2006	56.1	11	2.90	1	ND	1	ND	1	ND	1	ND	1
ML3-7	3644-30	12/4/2006	12/7/2006	91.8	11	BQL (0.471)	1	ND	1	BQL(0.837)	1	ND	1	ND	1
ML3-7	3644-30 Lab dup	12/4/2006	12/7/2006	91.2 (RRPD=0.656)	11	BQL (0.497)(RPD=NA)	1	ND (RPD=NA)	1	BQL(0.858)(RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set within the calibration range. *MDL and QL should be raised by the same factor as the dilution factor for those samples that were diluted. ** A lesser dilution resulted in lack of separation between peaks of interest due to a much larger adjacent chloride peak.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (**DF**), if applicable.
2. " -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

Metals

Report Date:

12/19/06

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Technical Directive:

3ME374HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		FIELD BLANK		PMW-3		PMW-3		ML 6-3		ML 6-3		ML 6-5	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	ND	1	BQL(0.100)	1	BQL(0.120) (RPD=NA)	1	1.64	1	1.54 (RPD=6.29)	1	BQL(0.088)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	ND	1	0.020	1	BQL(0.018) (RPD=NA)	1	0.122	1	0.120 (RPD=1.65)	1	BQL(0.008)	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	ND	1	0.205	1	0.206 (RPD=0.49)	1	0.232	1	0.232 (RPD=0.00)	1	0.198	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	ND	1	0.027	1	0.027 (RPD=0.00)	1	0.071	1	0.072 (RPD=1.40)	1	0.038	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	ND	1	15.6	1	15.6 (RPD=0.00)	1	57.8	1	58.2 (RPD=0.69)	1	38.2	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	BQL(0.002)	1	BQL(0.002) (RPD=NA)	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	BQL(0.007)	1	9.34	1	9.31 (RPD=0.32)	1	20.8	1	20.9 (RPD=0.48)	1	6.53	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	ND	1	1.28	1	1.24 (RPD=3.17)	1	3.41	1	3.48 (RPD=2.03)	1	2.69	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	ND	1	6.16	1	6.15 (RPD=0.16)	1	14.8	1	14.8 (RPD=0.00)	1	8.02	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	ND	1	0.048	1	0.049 (RPD=2.06)	1	0.287	1	0.286 (RPD=0.35)	1	0.172	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	BQL(0.002)	1	BQL(0.002) (RPD=NA)	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1	BQL(0.003)	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	ND	1	55.0	1	56.0 (RPD=1.80)	1	120	1	120 (RPD=0.00)	1	88.6	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1	ND	1	ND (RPD=NA)	1	BQL(0.003)	1	BQL(0.006) (RPD=NA)	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.007)	1	BQL(0.009)	1	BQL(0.008) (RPD=NA)	1	0.014	1	0.012 (RPD=15.38)	1	0.013	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	ND	1	BQL(0.004)	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	BQL(0.007)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	ND	1	0.088	1	0.087 (RPD=1.14)	1	0.754	1	0.756 (RPD=0.26)	1	0.322	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	BQL(0.002)	1	BQL(0.002) (RPD=NA)	1	0.044	1	0.039 (RPD=12.05)	1	BQL(0.003)	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	ND	1	ND	1	BQL(0.006) (RPD=NA)	1	BQL(0.018)	1	BQL(0.015) (RPD=NA)	1	BQL(0.016)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1	ND	1	ND (RPD=NA)	1	BQL(0.006)	1	BQL(0.004) (RPD=NA)	1	BQL(0.003)	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	BQL(0.007)	1	ND (RPD=NA)	1	BQL(0.016)	1	BQL(0.014) (RPD=NA)	1	BQL(0.015)	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	BQL(0.110)	1	14.4	1	14.5 (RPD=0.69)	1	15.0	1	14.9 (RPD=0.67)	1	15.7	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND	1	8.80	1	8.92 (RPD=1.35)	1	20.6	1	20.4 (RPD=0.98)	1	7.90	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	ND	1	1.15	1	1.15 (RPD=0.00)	1	0.211	1	0.215 (RPD=1.88)	1	0.760	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. * -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

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Technical Directive:

3ME374HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML 6-7		ML 5-3		ML 5-5		ML 5-7		ML 4-3		ML 4-3	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	ND	1	0.184	1	0.141	1	0.142	1	0.143	1	BQL(0.125) (RPD=NA)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	BQL(0.014)	1	0.202	1	BQL(0.011)	1	BQL(0.014)	1	0.063	1	0.059 (RPD=6.56)	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.184	1	0.330	1	0.207	1	0.195	1	0.231	1	0.232 (RPD=0.43)	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.026	1	0.099	1	0.031	1	0.027	1	0.098	1	0.098 (RPD=0.00)	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	34.9	1	43.0	1	31.1	1	35.0	1	50.1	1	50.2 (RPD=0.20)	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	0.009	1	ND	1	ND	1	BQL(0.004)	1	BQL(0.004) (RPD=NA)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	3.99	1	66.3	1	6.25	1	4.59	1	28.1	1	28.2 (RPD=0.36)	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.83	1	2.05	1	1.22	1	1.59	1	1.31	1	1.26 (RPD=3.89)	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	4.52	1	24.0	1	9.38	1	5.46	1	18.6	1	18.6 (RPD=0.00)	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.202	1	0.166	1	0.114	1	0.247	1	0.241	1	0.242 (RPD=0.41)	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.002)	1	BQL(0.002)	1	BQL(0.002)	1	BQL(0.001)	1	ND (RPD=NA)	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	196	1	140	1	95.6	1	158	1	70.8	1	70.7 (RPD=0.14)	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	BQL(0.003)	1	0.009	1	BQL(0.004)	1	ND	1	BQL(0.005)	1	BQL(0.002) (RPD=NA)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	0.011	1	0.011	1	BQL(0.011)	1	0.012	1	BQL(0.007)	1	BQL(0.008) (RPD=NA)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.004)	1	ND	1	BQL(0.005)	1	ND	1	ND	1	ND (RPD=NA)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.352	1	0.375	1	0.259	1	0.379	1	0.646	1	0.645 (RPD=0.15)	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.001)	1	0.005	1	0.005	1	BQL(0.003)	1	0.005	1	BQL(0.003) (RPD=NA)	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.010)	1	BQL(0.006)	1	BQL(0.010)	1	BQL(0.014)	1	BQL(0.012)	1	BQL(0.014) (RPD=NA)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1	ND	1	BQL(0.004)	1	ND	1	BQL(0.004)	1	ND (RPD=NA)	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	BQL(0.012)	1	ND	1	BQL(0.011)	1	BQL(0.013)	1	BQL(0.016)	1	BQL(0.020) (RPD=NA)	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	15.4	1	8.98	1	16.9	1	15.3	1	10.1	1	10.1 (RPD=0.00)	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	22.0	1	21.5	1	4.15	1	11.0	1	8.87	1	8.84 (RPD=0.34)	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.238	1	0.470	1	0.754	1	0.407	1	0.206	1	0.183 (RPD=11.83)	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

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3ME374HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML 4-5		DUPLICATE-1 (ML 5-5)		ML 4-7		ML 4-7		PMW-2		ML 1-3	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	0.496	1	BQL(0.125)	1	BQL(0.065)	1	BQL(0.047) (RPD=NA)	1	BQL(0.109)	1	BQL(0.131)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	BQL(0.009)	1	ND	1	BQL(0.009)	1	BQL(0.007) (RPD=NA)	1	BQL(0.012)	1	0.019	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.185	1	0.199	1	0.176	1	0.177 (RPD=0.57)	1	0.183	1	0.252	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.026	1	0.023	1	0.029	1	0.029 (RPD=0.00)	1	0.028	1	0.087	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	23.6	1	31.7	1	40.1	1	40.1 (RPD=0.00)	1	48.9	1	54.8	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.003)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	4.61	1	4.46	1	2.44	1	2.45 (RPD=0.41)	1	8.45	1	20.5	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.17	1	1.29	1	1.74	1	1.76 (RPD=1.14)	1	2.61	1	2.78	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	5.10	1	9.32	1	5.21	1	5.25 (RPD=0.76)	1	7.91	1	15.6	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.115	1	0.115	1	0.275	1	0.275 (RPD=0.00)	1	0.139	1	0.264	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.002)	1	BQL(0.001)	1	BQL(0.001) (RPD=NA)	1	BQL(0.003)	1	BQL(0.001)	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	76.3	1	93.2	1	153	1	152 (RPD=0.66)	1	55.6	1	274	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.003)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.004)	1	BQL(0.006)	1	BQL(0.006)	1	BQL(0.005) (RPD=NA)	1	BQL(0.005)	1	BQL(0.007)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.009)	1	BQL(0.005)	1	BQL(0.006)	1	ND (RPD=NA)	1	BQL(0.005)	1	BQL(0.005)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.227	1	0.266	1	0.560	1	0.558 (RPD=0.36)	1	0.176	1	0.634	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.013	1	BQL(0.003)	1	BQL(0.003)	1	BQL(0.004) (RPD=NA)	1	BQL(0.003)	1	0.005	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.008)	1	BQL(0.010)	1	BQL(0.017)	1	BQL(0.017) (RPD=NA)	1	0.019	1	0.020	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.003)	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	BQL(0.010)	1	BQL(0.013)	1	BQL(0.015)	1	BQL(0.015) (RPD=NA)	1	BQL(0.015)	1	BQL(0.014)	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	15.9	1	17.3	1	15.7	1	15.8 (RPD=0.63)	1	13.0	1	9.00	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	14.5	1	3.92	1	9.76	1	9.79 (RPD=0.31)	1	22.1	1	65.0	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	1.08	1	0.343	1	0.222	1	0.218 (RPD=1.82)	1	0.723	1	0.166	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analysts:	S. Markham/S. Saye		Field Sample ID		ML 1-5		ML 1-7		PMW-1		PMW-1		PMW-4		PMW-4		
			Sample Lab ID		3644-15		3644-16		3644-17		3644-17 Lab Dup.*		3644-18		3644-18 Lab Dup.		
			Date Collected		11/30/06		11/30/06		11/30/06		11/30/06		12/1/06		12/1/06		
			Date Analyzed		12/13/06		12/13/06		12/13/06		12/13/06		12/13/06		12/13/06		
Method:	RSKSOP 213(2)																
			Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
			Names	Codes													

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML 2-3		ML 2-5		ML 2-7		PMW-5		PMW-6		DUPLICATE-2 (PMW-5)	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	BQL(0.121)	1	BQL(0.111)	1	0.163	1	BQL(0.094)	1	BQL(0.050)	1	BQL(0.078)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.030	1	ND	1	BQL(0.006)	1	BQL(0.010)	1	BQL(0.012)	1	BQL(0.008)	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.553	1	0.175	1	0.197	1	0.313	1	0.186	1	0.310	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.659	1	0.014	1	0.024	1	0.054	1	0.025	1	0.053	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	183	1	20.8	1	30.7	1	34.6	1	49.3	1	34.7	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.020	1	ND	1	ND	1	0.007	1	BQL(0.002)	1	0.007	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	BQL(0.003)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	130	1	1.15	1	2.31	1	50.7	1	15.8	1	50.3	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	7.91	1	1.08	1	1.81	1	3.07	1	3.56	1	3.11	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	51.5	1	3.19	1	3.01	1	7.59	1	5.70	1	7.60	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	1.03	1	0.084	1	0.150	1	0.171	1	0.154	1	0.172	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	BQL(0.003)	1	0.006	1	ND	1	BQL(0.002)	1	ND	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	369	1	82.4	1	192	1	55.3	1	56.0	1	55.1	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	0.012	1	ND	1	ND	1	BQL(0.006)	1	BQL(0.002)	1	BQL(0.006)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.010)	1	BQL(0.006)	1	BQL(0.005)	1	BQL(0.004)	1	BQL(0.007)	1	BQL(0.004)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	ND	1	BQL(0.007)	1	BQL(0.005)	1	ND	1	ND	1	ND	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	2.25	1	0.206	1	0.401	1	0.169	1	0.192	1	0.169	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.003)	1	BQL(0.004)	1	BQL(0.001)	1	BQL(0.001)	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	0.022	1	BQL(0.006)	1	BQL(0.016)	1	ND	1	BQL(0.017)	1	BQL(0.007)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.004)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	BQL(0.008)	1	BQL(0.009)	1	BQL(0.008)	1	ND	1	BQL(0.010)	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	11.5	1	15.5	1	16.1	1	16.9	1	13.8	1	16.8	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND	1	14.4	1	32.4	1	2.12	1	8.89	1	2.06	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.270	1	1.27	1	0.247	1	0.979	1	0.600	1	0.933	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit			ML 7-3		ML 7-5		ML 7-7		ML 3-3		ML 3-3		ML 3-5	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	1.95	1	BQL(0.047)	1	BQL(0.045)	1	BQL(0.103)	1	BQL(0.102) (RPD=NA)	1	0.859	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.041	1	BQL(0.009)	1	BQL(0.008)	1	BQL(0.018)	1	BQL(0.017) (RPD=NA)	1	BQL(0.015)	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.359	1	0.217	1	0.214	1	0.667	1	0.668 (RPD=0.15)	1	0.262	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.119	1	0.026	1	0.018	1	0.216	1	0.216 (RPD=0.00)	1	0.144	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	37.8	1	33.5	1	26.1	1	139	1	140 (RPD=0.72)	1	86.9	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.007	1	ND	1	ND	1	0.031	1	0.031 (RPD=0.00)	1	0.006	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	BQL(0.001)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	52.6	1	7.78	1	2.15	1	200	1	201 (RPD=0.50)	1	42.1	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	2.55	1	1.42	1	1.64	1	5.78	1	5.83 (RPD=0.86)	1	2.77	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	18.8	1	5.83	1	3.57	1	63.5	1	63.7 (RPD=0.31)	1	15.4	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.222	1	0.182	1	0.153	1	0.734	1	0.735 (RPD=0.14)	1	0.485	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	BQL(0.002)	1	BQL(0.002)	1	ND	1	ND (RPD=NA)	1	ND	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	318	1	105	1	207	1	254	1	255 (RPD=0.39)	1	84.5	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	BQL(0.004)	1	ND	1	ND	1	0.018	1	0.018 (RPD=0.00)	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.007)	1	BQL(0.010)	1	BQL(0.006)	1	0.012	1	BQL(0.008) (RPD=NA)	1	BQL(0.007)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	ND	1	BQL(0.004)	1	0.012	1	ND	1	ND (RPD=NA)	1	ND	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.487	1	0.402	1	0.282	1	1.91	1	1.92 (RPD=0.52)	1	0.669	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.047	1	BQL(0.002)	1	BQL(0.002)	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1	0.020	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.006)	1	BQL(0.011)	1	BQL(0.011)	1	ND	1	BQL(0.007) (RPD=NA)	1	0.020	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	0.011	1	BQL(0.006)	1	BQL(0.004)	1	BQL(0.004)	1	BQL(0.004) (RPD=NA)	1	BQL(0.006)	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	BQL(0.013)	1	BQL(0.016)	1	ND	1	ND (RPD=NA)	1	BQL(0.017)	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	13.7	1	18.8	1	15.5	1	4.92	1	4.92 (RPD=0.00)	1	17.2	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	21.6	1	0.505	1	7.84	1	ND	1	ND (RPD=NA)	1	ND	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.096	1	0.361	1	0.180	1	0.154	1	0.159 (RPD=3.19)	1	0.301	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. * -" denotes that the information is not available or the analyte is not analyzed.

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Analytical Service Results Report

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Technical Directive: 3ME374HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 213(2)

Analytes		Unit	MDL	QL	Field Sample ID		ML 3-7		ML 3-7							
Names	Codes				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND (RPD=NA)	1								
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	0.972	1	0.961 (RPD=1.14)	1								
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	BQL(0.013)	1	BQL(0.010) (RPD=NA)	1								
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.281	1	0.278 (RPD=1.07)	1								
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.121	1	0.121 (RPD=0.00)	1								
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1								
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	78.8	1	78.9 (RPD=0.13)	1								
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.007	1	0.006 (RPD=15.38)	1								
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1								
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1								
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND (RPD=NA)	1								
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	47.2	1	47.4 (RPD=0.42)	1								
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.97	1	1.96 (RPD=0.51)	1								
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	10.3	1	10.3 (RPD=0.00)	1								
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.557	1	0.550 (RPD=1.26)	1								
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1								
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	113	1	113 (RPD=0.00)	1								
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND (RPD=NA)	1								
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	BQL(0.003)	1	BQL(0.004) (RPD=NA)	1								
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.008)	1	BQL(0.008) (RPD=NA)	1								
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	ND	1	ND (RPD=NA)	1								
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.701	1	0.703 (RPD=0.28)	1								
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.024	1	0.024 (RPD=0.00)	1								
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	0.022	1	BQL(0.017) (RPD=NA)	1								
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.005)	1	BQL(0.007) (RPD=NA)	1								
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	BQL(0.014)	1	BQL(0.011) (RPD=NA)	1								
Sillicon (Si)	7440-21-3	mg/L	0.049	0.163	20.0	1	20.0 (RPD=0.00)	1								
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	BQL(0.162)	1	BQL(0.168) (RPD=NA)	1								
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.485	1	0.465 (RPD=4.21)	1								
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND (RPD=NA)	1								

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. " -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **12/20/06**

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Technical Directive: **3ME374HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	FIELD BLANK	PMW-3	ML 6-3	ML 6-3	ML 6-3	ML 6-5
Sample Lab ID	3644-01	3644-02	3644-03	3644-03 Lab Dup.	3644-03 Lab Dup.*	3644-04
Date Collected	11/29/06	11/29/06	11/29/06	11/29/06	11/29/06	11/29/06
Date Analyzed	12/13, 12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	0.105	1	17.2	5	108	5	106 (RPD=1.87)	5	110	5	3.09	5
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	BQL(0.200)	1	BQL(1.40)	5	3.30	5	3.30 (RPD=0.00)	5	3.69	5	BQL(1.70)	5
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	1.76	1	1.28	5	1.93	5	1.93 (RPD=0.00)	5	2.13 (RPD=9.85)	5	1.62	5
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	5.75	1	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	0.225	1	0.380	5	1.04	5	1.16 (RPD=10.91)	5	0.980	5	BQL(0.385)	5
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	ND	1	7.18	5	11.4	5	11.4 (RPD=0.00)	5	9.34 (RPD=19.86)	5	9.17	5
Uranium (U)	7440-61-1	µg/L	0.002	0.008	ND	1	BQL(0.025)	5	0.270	5	0.265 (RPD=1.87)	5	0.270	5	0.035	5
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	BQL(0.300)	1	8.62	5	5.68	5	5.61 (RPD=1.24)	5	9.18 (RPD=47.11)	5	7.05	5
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	1	ND	5	ND	5	ND (RPD=NA)	5	ND (RPD=NA)	5	ND	5

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Laboratory: **Metals**

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Technical Directive: **3ME374HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 6-7	ML 5-3	ML 5-5	ML 5-7	ML 4-3	NML 4-3
Sample Lab ID	3644-05	3644-06	3644-07	3644-08	3644-09	3644-09 Lab Dup.*
Date Collected	11/29/06	11/29/06	11/29/06	11/29/06	11/29/06	11/29/06
Date Analyzed	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	8.09	5	186	5	5.15	5	5.72	5	54.0	5	55.2 (RPD=2.19)	5
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	BQL(0.835)	5	BQL(1.16)	5	1.80	5	BQL(1.50)	5	BQL(1.26)	5	BQL(1.40) (RPD=NA)	5
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	0.850	5	1.56	5	1.16	5	1.17	5	2.38	5	1.65 (RPD=36.23)	5
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	BQL(0.180)	5	BQL(0.225)	5	BQL(0.345)	5	BQL(0.310)	5	0.505	5	BQL(0.440) (RPD=NA)	5
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	7.40	5	7.66	5	11.0	5	10.6	5	9.00	5	10.8 (RPD=18.18)	5
Uranium (U)	7440-61-1	µg/L	0.002	0.008	0.240	5	0.090	5	0.050	5	0.130	5	0.120	5	0.090 (RPD=28.57)	5
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	6.59	5	6.48	5	2.46	5	3.62	5	9.34	5	10.6 (RPD=12.64)	5
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	5	BQL(0.230)	5	ND	5	ND	5	ND	5	ND (RPD=NA)	5

Comments:

Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive:

3ME374HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 257(1)

Field Sample ID		ML 4-5		ML 4-5		DUPLICATE-1 (ML 5-5)		ML 4-7		PMW-2		ML 1-3	
Sample Lab ID		3644-10		3644-10 Lab Dup.		3644-11		3644-12		3644-13		3644-14	
Date Collected		11/29/06		11/29/06		11/29/06		11/30/06		11/30/06		11/30/06	
Date Analyzed		12/14, 12/15 & 12/18/06		12/14, 12/15 & 12/18/06		12/14, 12/15 & 12/18/06		12/14, 12/15 & 12/18/06		12/14, 12/15 & 12/18/06		12/14, 12/15 & 12/18/06	
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.027	0.089	5.87	5	6.10 (RPD=3.84)	5	0.825	5	3.59	5	7.90	5	10.4	5
0.094	0.352	BQL(1.53)	5	BQL(1.74) (RPD=NA)	5	2.47	5	BQL(0.675)	5	BQL(1.02)	5	BQL(1.66)	5
0.034	0.115	3.21	5	3.18 (RPD=0.94)	5	1.77	5	1.10	5	0.700	5	1.84	5
0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
0.020	0.067	0.705	5	0.710 (RPD=0.71)	5	0.515	5	0.485	5	BQL(0.305)	5	0.685	5
0.203	0.677	11.4	5	11.9 (RPD=4.29)	5	12.0	5	8.14	5	6.52	5	8.44	5
0.002	0.008	0.275	5	0.280 (RPD=1.80)	5	BQL(0.020)	5	0.075	5	0.335	5	0.195	5
0.123	0.411	8.89	5	9.32 (RPD=4.72)	5	30.9	5	4.07	5	6.60	5	4.02	5
0.033	0.111	ND	5	ND (RPD=NA)	5	ND	5	ND	5	ND	5	ND	5

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: **3ME374HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 1-5	ML 1-7	PMW-1	PMW-1	PMW-1	PMW-4
Sample Lab ID	3644-15	3644-16	3644-17	3644-17 Lab Dup.	3644-17 Lab Dup.*	3644-18
Date Collected	11/30/06	11/30/06	11/30/06	11/30/06	11/30/06	12/1/06
Date Analyzed	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	9.23	5	4.25	5	7.59	5	7.80 (RPD=2.73)	5	7.80 (RPD=2.73)	5	17.5	5
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	7.46	5	BQL(0.645)	5	6.92	5	7.02 (RPD=1.43)	5	7.13 (RPD=2.99)	5	BQL(0.940)	5
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	1.76	5	1.23	5	2.64	5	2.84 (RPD=7.30)	5	1.72 (RPD=42.20)	5	1.26	5
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	1.28	5	0.470	5	1.33	5	1.29 (RPD=3.05)	5	1.26 (RPD=5.41)	5	BQL(0.125)	5
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	8.50	5	6.96	5	5.94	5	5.84 (RPD=1.70)	5	4.02 (RPD=38.55)	5	8.88	5
Uranium (U)	7440-61-1	µg/L	0.002	0.008	2.82	5	BQL(0.015)	5	0.455	5	0.435 (RPD=4.49)	5	0.430 (RPD=5.65)	5	0.035	5
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	8.92	5	BQL(1.88)	5	6.54	5	7.03 (RPD=7.22)	5	5.06 (RPD=25.52)	5	43.9	5
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	5	ND	5	ND	5	ND (RPD=NA)	5	ND (RPD=NA)	5	ND	5

Comments:

Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Laboratory: **Metals** Report Date: **12/20/06**

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Technical Directive: **3ME374HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 2-3	ML 2-5	ML 2-7	PMW-5	PMW-6	DUPLICATE-2 (PMW-5)
Sample Lab ID	3644-19	3644-20	3644-21	3644-22	3644-23	3644-24
Date Collected	12/1/06	12/1/06	12/2/06	12/2/06	12/2/06	12/2/06
Date Analyzed	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06

Analytes		Unit	MDL	QL	Data		DF	Data		DF	Data		DF	Data		DF	Data		DF
Names	Codes																		
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	10.4		5	5.45		5	8.99		5	9.62		5	10.1		5
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	12.0		5	BQL(1.50)		5	BQL(1.40)		5	BQL(1.71)		5	BQL(1.18)		5
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	3.09		5	2.54		5	1.18		5	1.08		5	1.24		5
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—		—	—		—	—		—	—		—	—		—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	0.430		5	1.34		5	BQL(0.295)		5	BQL(0.135)		5	BQL(0.120)		5
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	5.18		5	6.83		5	7.40		5	14.3		5	8.76		5
Uranium (U)	7440-61-1	µg/L	0.002	0.008	0.060		5	0.300		5	2.70		5	ND		5	ND		5
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	9.31		5	BQL(1.72)		5	2.54		5	2.12		5	ND		5
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND		5	ND		5	ND		5	ND		5	ND		5

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Laboratory: **Metals** Report Date: **12/20/06**

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Technical Directive: **3ME374HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 7-3	ML 7-5	ML 7-5	ML 7-7	ML 3-3	ML 3-3
Sample Lab ID	3644-25	3644-26	3644-26 Lab Dup.	3644-27	3644-28	3644-28 Lab Dup.*
Date Collected	12/2/06	12/4/06	12/4/06	12/4/06	12/4/06	12/4/06
Date Analyzed	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06	12/14, 12/15 & 12/18/06

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	27.6	5	1.26	5	1.22 (RPD=3.23)	5	3.94	5	3.48	5	3.71 (RPD=6.40)	5
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	6.08	5	3.00	5	2.94 (RPD=2.02)	5	1.76	5	10.3	5	11.0 (RPD=6.57)	5
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	1.64	5	1.58	5	1.59 (RPD=0.63)	5	2.02	5	2.28	5	2.83 (RPD=21.53)	5
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	1.12	5	BQL(0.310)	5	BQL(0.270) (RPD=NA)	5	0.480	5	BQL(0.335)	5	0.430 (RPD=NA)	5
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	10.6	5	10.9	5	11.9 (RPD=8.77)	5	8.29	5	15.8	5	16.4 (RPD=3.73)	5
Uranium (U)	7440-61-1	µg/L	0.002	0.008	0.305	5	0.430	5	0.405 (RPD=5.99)	5	0.125	5	BQL(0.010)	5	BQL(0.010) (RPD=NA)	5
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	4.81	5	22.9	5	23.1 (RPD=0.87)	5	8.64	5	4.62	5	8.79 (RPD=62.19)	5
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	BQL(0.210)	5	ND	5	ND (RPD=NA)	5	ND	5	ND	5	ND (RPD=NA)	5

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: 3ME374HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 257(1)

Field Sample ID	ML 3-5		ML 3-7													
Sample Lab ID	3644-29		3644-30													
Date Collected	12/4/06		12/4/06													
Date Analyzed	12/14, 12/15 & 12/18/06		12/14, 12/15 & 12/18/06													
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	1.20	5	1.18	5								
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	6.35	5	4.86	5								
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	1.71	5	1.62	5								
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	0.640	5	0.440	5								
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	42.0	5	13.8	5								
Uranium (U)	7440-61-1	µg/L	0.002	0.008	0.235	5	0.115	5								
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	3.52	5	2.36	5								
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	5	ND	5								

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Laboratory: **Metals** Report Date: **12/18/06**

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Technical Directive: **3ME375HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Field Sample ID	FIELD BLANK	PMW-3	ML 6-3	ML 6-5	ML 6-5	ML 6-7
Sample Lab ID	3645-01	3645-02	3645-03	3645-04	3645-04 Lab Dup.	3645-05
Date Collected	11/29/06	11/29/06	11/29/06	11/29/06	11/29/06	11/29/06
Date Analyzed	12/7, 12/11, 12/12 & 12/13/06	12/7, 12/11 & 12/12/06	12/7, 12/11 & 12/12/06	12/7, 12/11 & 12/12/06	12/7, 12/11 & 12/12/06	12/7, 12/11 & 12/12/06

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	ND	1	13.4	1	128	1	1.34	1	1.39 (RPD=3.66)	1	6.85	1
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	BQL(0.186)	1	0.458	1	BQL(0.281)	1	BQL(0.284)	1	BQL(0.297) RPD=NA	1	BQL(0.127)	1
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	1.25	1	BQL(0.048)	1	0.355	1	BQL(0.085)	1	0.118 (RPD=NA)	1	BQL(0.079)	1
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	3.22	1	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	ND	1	6.11	1	6.71	1	5.37	1	4.89 (RPD=9.36)	1	4.68	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND	1	ND	1	0.060	1	ND	1	ND (RPD=NA)	1	0.142	1
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	ND	1	1.20	1	BQL(0.338)	1	ND	1	ND (RPD=NA)	1	ND	1
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	BQL(0.052)	1	BQL(0.041)	1	BQL(0.031)	1	ND	1	ND (RPD=NA)	1	ND	1

Comments:

Chromium was analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species ArC at mass 52. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: 3ME375HW

Sample Results (1, 2)

Analysts:	Steve Markham		Field Sample ID		ML 5-3		ML 5-5		ML 5-7		ML 4-3		ML 4-5		DUPLICATE-1 (ML 5-5)	
			Sample Lab ID		3645-06		3645-07		3645-08		3645-09		3645-10		3645-11	
			Date Collected		11/29/06		11/29/06		11/29/06		11/29/06		11/29/06		11/29/06	
			Date Analyzed		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06	
Method:	RSKSOP 257(1)															
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	255	1	0.941	1	3.38	1	72.6	1	8.55	1	0.751	1
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	BQL(0.195)	1	0.427	1	BQL(0.251)	1	0.333	1	0.326	1	0.383	1
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	0.433	1	0.201	1	BQL(0.075)	1	0.332	1	ND	1	0.148	1
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	0.088	1	BQL(0.024)	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	4.72	1	4.94	1	4.78	1	5.56	1	4.14	1	6.57	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.009	1	ND	1	0.127	1	ND	1	0.084	1	0.046	1
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	BQL(0.316)	1	0.976	1	ND	1	BQL(0.267)	1	1.15	1	1.15	1
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	BQL(0.042)	1	BQL(0.034)	1	ND	1	ND	1	ND	1	ND	1

Comments:
Chromium was analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species ArC at mass 52. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.

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Sample Results (1, 2)

Analysts:	Steve Markham		Field Sample ID		ML 4-7		PMW-2		PMW-2		ML 1-3		ML 1-5		ML 1-7			
	Method: RSKSOP 257(1)				Sample Lab ID		3645-12		3645-13		3645-13 Lab Dup.		3645-14		3645-15		3645-16	
					Date Collected		11/30/06		11/30/06		11/30/06		11/30/06		11/30/06		11/30/06	
					Date Analyzed		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06	
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names		Codes																
Arsenic (As)		7440-38-2	µg/L	0.024	0.080	4.36	1	11.4	1	11.8 (RPD=3.45)	1	13.4	1	9.63	1	5.85	1	
Chromium (Cr)		7440-47-3	µg/L	0.085	0.317	BQL(0.148)	1	BQL(0.304)	1	0.347 (RPD=NA)	1	ND	1	BQL(0.248)	1	ND	1	
Copper (Cu)		7440-50-8	µg/L	0.031	0.104	0.205	1	0.398	1	0.411 (RPD=3.21)	1	0.467	1	BQL(0.102)	1	0.163	1	
Iron (Fe)		7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—	
Lead (Pb)		7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	
Selenium (Se)		7782-49-2	µg/L	0.183	0.610	5.12	1	5.41	1	5.15 (RPD=4.92)	1	6.57	1	6.55	1	5.03	1	
Uranium (U)		7440-61-1	µg/L	0.002	0.007	0.076	1	0.374	1	0.362 (RPD=3.26)	1	0.215	1	1.57	1	0.020	1	
Zinc (Zn)		7440-62-2	µg/L	0.111	0.370	ND	1	1.11	1	1.15 (RPD=3.54)	1	0.705	1	ND	1	ND	1	
Mercury (Hg)		7439-97-6	µg/L	0.030	0.100	ND	1	BQL(0.035)	1	BQL(0.032) (RPD=NA)	1	BQL(0.062)	1	BQL(0.072)	1	BQL(0.077)	1	

Comments:
Chromium was analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species ArC at mass 52. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive:

3ME375HW

Sample Results (1, 2)

Analysts:

Steve Markham

Method:

RSKSOP 257(1)

Analysts:	Steve Markham		Field Sample ID		PMW-1		PMW-4		ML 2-3		ML 2-5		ML 2-7		PMW-5		
	Sample Lab ID				3645-17		3645-18		3645-19		3645-20		3645-21		3645-22		
Method:	RSKSOP 257(1)		Date Collected		11/30/06		12/1/06		12/1/06		12/1/06		12/2/06		12/2/06		
			Date Analyzed		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes																
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	8.14	1	22.7	1	18.4	1	4.59	1	8.36	1	4.14	1	
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	0.396	1	0.441	1	2.97	1	0.796	1	BQL(0.096)	1	BQL(0.262)	1	
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	0.388	1	0.309	1	1.88	1	2.51	1	BQL(0.092)	1	0.156	1	
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—	
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	BQL(0.037)	1	2.46	1	ND	1	ND	1	
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	3.26	1	6.52	1	4.66	1	5.38	1	4.75	1	6.34	1	
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.145	1	0.078	1	0.403	1	0.746	1	2.22	1	BQL(0.004)	1	
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	ND	1	47.9	1	35.5	1	0.559	1	ND	1	BQL(0.207)	1	
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1	ND	1	ND	1	ND	1	ND	1	BQL(0.054)	1	

Comments:
Chromium was analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species ArC at mass 52. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Laboratory: Metals Report Date: 12/18/06

Technical Directive: 3ME375HW

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(1)

Analysts:	Steve Markham				Field Sample ID		PMW-5		PMW-6		DUPLICATE-2 (PMW-5)		ML 7-3		ML 7-5		ML 7-7		
	RSKSOP 257(1)				Sample Lab ID		3645-22 Lab Dup.		3645-23		3645-24		3645-25		3645-26		3645-27		
Date Collected					12/2/06		12/2/06		12/2/06		12/2/06		12/4/06		12/4/06				
Date Analyzed					12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06		12/7, 12/11 & 12/12/06				
Method:																			
Analytes				Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																		
Arsenic (As)		7440-38-2	µg/L	0.024	0.080	4.33 (RPD=4.49)	1	8.17	1	4.15	1	36.0	1	1.44	1	4.30	1		
Chromium (Cr)		7440-47-3	µg/L	0.085	0.317	BQL(0.274) (RPD=NA)	1	BQL(0.200)	1	BQL(0.277)	1	BQL(0.302)	1	BQL(0.310)	1	BQL(0.159)	1		
Copper (Cu)		7440-50-8	µg/L	0.031	0.104	0.176 (RPD=12.05)	1	0.303	1	0.287	1	0.581	1	BQL(0.077)	1	ND	1		
Iron (Fe)		7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—		
Lead (Pb)		7439-92-1	µg/L	0.018	0.060	ND (RPD=NA)	1	BQL(0.041)	1	ND	1	0.174	1	ND	1	ND	1		
Selenium (Se)		7782-49-2	µg/L	0.183	0.610	6.28 (RPD=0.95)	1	5.11	1	6.27	1	7.19	1	4.84	1	4.57	1		
Uranium (U)		7440-61-1	µg/L	0.002	0.007	BQL(0.003) (RPD=NA)	1	0.010	1	BQL(0.004)	1	0.055	1	0.437	1	0.108	1		
Zinc (Zn)		7440-62-2	µg/L	0.111	0.370	BQL(0.248) (RPD=NA)	1	7.51	1	BQL(0.344)	1	BQL(0.275)	1	ND	1	ND	1		
Mercury (Hg)		7439-97-6	µg/L	0.030	0.100	BQL(0.036) (RPD=NA)	1	BQL(0.034)	1	ND	1	ND	1	ND	1	ND	1		

Comments:
Chromium was analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species ArC at mass 52. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: **3ME375HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Analytes		Unit	MDL		QL		Data		DF		Data		DF		Data		DF	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	4.82	1	1.25	1	1.14	1								
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	ND	1	0.352	1	ND	1								
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	1.36	1	1.17	1	0.454	1								
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	0.095	1	ND	1								
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	8.65	1	16.3	5	5.33	1								
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND	1	0.134	1	BQL(0.002)	1								
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	1.15	1	3.27	1	ND	1								
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1	ND	1	ND	1								

Comments:
 Chromium was analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species ArC at mass 52. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive:3ME375HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 213(2)

Field Sample ID		FIELD BLANK		PMW-3		PMW-3		ML 6-3		ML 6-5		ML 6-7				
Sample Lab ID		3645-01		3645-02		3645-02 Lab Dup.		3645-03		3645-04		3645-05				
Date Collected		11/29/06		11/29/06		11/29/06		11/29/06		11/29/06		11/29/06				
Date Analyzed		12/7/06		12/7/06		12/7/06		12/7/06		12/7/06		12/7/06				
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	ND	1	0.023	1	0.020 (RPD=13.95)	1	0.152	1	0.019	1	0.029	1
Boron (B)	7440-42-8	mg/L	0.013	0.044	ND	1	0.198	1	0.200 (RPD=1.01)	1	0.231	1	0.196	1	0.184	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	ND	1	0.029	1	0.029 (RPD=0.00)	1	0.068	1	0.039	1	0.026	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	ND	1	14.9	1	15.1 (RPD=1.33)	1	56.4	1	37.6	1	35.0	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	BQL(0.001)	1	BQL(0.002) (RPD=NA)	1	BQL(0.003)	1	BQL(0.001)	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	BQL(0.006)	1	8.38	1	8.46 (RPD=0.95)	1	21.7	1	6.45	1	4.32	1
Potassium (K)	7440-09-7	mg/L	0.055	0.184	ND	1	1.22	1	1.25 (RPD=2.43)	1	3.79	1	2.78	1	1.91	1
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	ND	1	5.62	1	5.78 (RPD=2.81)	1	14.5	1	7.82	1	4.45	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	ND	1	0.047	1	0.048 (RPD=2.11)	1	0.279	1	0.169	1	0.203	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	BQL(0.002)	1	BQL(0.001) (RPD=NA)	1	BQL(0.004)	1	BQL(0.003)	1	BQL(0.003)	1
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	ND	1	53.5	1	54.9 (RPD=2.58)	1	118	1	85.5	1	181	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	ND	1	ND (RPD=NA)	1	BQL(0.003)	1	ND	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	ND	1	BQL(0.003)	1	BQL(0.006) (RPD=NA)	1	BQL(0.009)	1	BQL(0.006)	1	BQL(0.009)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	ND	1	0.011	1	BQL(0.007) (RPD=NA)	1	0.021	1	0.016	1	0.018	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	ND	1	0.084	1	0.086 (RPD=2.35)	1	0.728	1	0.320	1	0.380	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1	ND	1	ND (RPD=NA)	1	BQL(0.017)	1	BQL(0.014)	1	BQL(0.015)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	ND	1	ND (RPD=NA)	1	BQL(0.006)	1	BQL(0.010)	1	BQL(0.008)	1
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	BQL(0.092)	1	15.2	1	15.4 (RPD=1.31)	1	13.1	1	16.4	1	16.2	1
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	ND	1	10.7	1	10.7 (RPD=0.00)	1	22.4	1	36.0	1	27.8	1
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	BQL(0.019)	1	1.51	1	1.52 (RPD=0.66)	1	0.217	1	0.972	1	0.274	1
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

- Notes:
- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
 - "-" denotes that the information is not available or the analyte is not analyzed.

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analysts:	S. Markham/S. Saye	Field Sample ID		ML 5-3		ML 5-5		ML 5-7		ML 4-3		ML 4-5		DUPLICATE-1 (ML 5-5)				
		Sample Lab ID		3645-06		3645-07		3645-08		3645-09		3645-10		3645-11				
		Date Collected		11/29/06		11/29/06		11/29/06		11/29/06		11/29/06		11/29/06				
		Date Analyzed		12/7/06		12/7/06		12/7/06		12/7/06		12/7/06		12/7/06				
Method:	RSKSOP 213(2)	Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF		
		Names	Codes															
		Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.287	1	0.022	1	0.026	1	0.100	1	0.022	1	0.019	1		
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.349	1	0.207	1	0.196	1	0.245	1	0.188	1	0.206	1		
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.100	1	0.034	1	0.028	1	0.097	1	0.026	1	0.033	1		
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	42.2	1	31.3	1	35.6	1	48.1	1	22.4	1	31.0	1		
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.010	1	BQL(0.001)	1	ND	1	0.005	1	ND	1	BQL(0.001)	1		
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	BQL(0.001)	1	ND	1	ND	1	ND	1	ND	1	ND	1		
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	69.5	1	6.36	1	4.92	1	31.6	1	4.91	1	6.26	1		
Potassium (K)	7440-09-7	mg/L	0.055	0.184	1.99	1	1.26	1	1.75	1	1.14	1	1.08	1	1.24	1		
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	23.3	1	8.98	1	5.53	1	17.7	1	4.95	1	8.96	1		
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.161	1	0.115	1	0.251	1	0.236	1	0.110	1	0.115	1		
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.002)	1	BQL(0.003)	1	BQL(0.001)	1	BQL(0.003)	1	BQL(0.003)	1		
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	136	1	87.8	1	155	1	69.6	1	72.7	1	89.6	1		
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	BQL(0.007)	1	ND	1	ND	1	BQL(0.003)	1	ND	1	ND	1		
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.009)	1	BQL(0.008)	1	BQL(0.007)	1	BQL(0.009)	1	BQL(0.006)	1	BQL(0.005)	1		
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	BQL(0.010)	1	0.017	1	0.018	1	0.016	1	0.015	1	0.018	1		
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.376	1	0.264	1	0.387	1	0.631	1	0.216	1	0.263	1		
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1	BQL(0.014)	1	BQL(0.011)	1	BQL(0.014)	1	BQL(0.007)	1	BQL(0.012)	1		
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	BQL(0.003)	1	ND	1	ND	1	ND	1	BQL(0.002)	1	BQL(0.002)	1		
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	BQL(0.008)	1	BQL(0.010)	1	ND	1	BQL(0.007)	1	BQL(0.007)	1		
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	8.87	1	17.9	1	16.0	1	10.2	1	15.6	1	17.7	1		
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	22.7	1	58.5	1	24.9	1	10.4	1	16.1	1	64.4	1		
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	0.558	1	0.960	1	0.497	1	0.210	1	1.36	1	0.965	1		
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. * -* denotes that the information is not available or the analyte is not analyzed.

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML 4-7		ML 4-7		PMWV-2		ML 1-3		ML 1-5		ML 1-7	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.022	1	0.022 (RPD=0.00)	1	0.034	1	0.049	1	0.039	1	0.026	1
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.182	1	0.181 (RPD=0.55)	1	0.189	1	0.253	1	0.239	1	0.181	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.032	1	0.032 (RPD=0.00)	1	0.030	1	0.085	1	0.032	1	0.029	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	38.8	1	38.8 (RPD=0.00)	1	47.8	1	53.0	1	26.7	1	37.3	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	BQL(0.002)	1	BQL(0.003)	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	3.71	1	3.71 (RPD=0.00)	1	10.6	1	21.4	1	5.49	1	4.67	1
Potassium (K)	7440-09-7	mg/L	0.055	0.184	1.70	1	1.69 (RPD=0.59)	1	2.59	1	2.70	1	1.56	1	1.74	1
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	4.96	1	4.93 (RPD=0.61)	1	7.81	1	14.8	1	4.42	1	4.60	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.266	1	0.266 (RPD=0.00)	1	0.140	1	0.261	1	0.154	1	0.212	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.002) (RPD=NA)	1	0.004	1	BQL(0.003)	1	0.005	1	BQL(0.003)	1
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	148	1	148 (RPD=0.00)	1	54.6	1	265	1	219	1	185	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.008)	1	BQL(0.004) (RPD=NA)	1	BQL(0.006)	1	BQL(0.010)	1	BQL(0.008)	1	BQL(0.009)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	0.017	1	0.016 (RPD=6.06)	1	0.017	1	0.028	1	0.028	1	0.025	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.538	1	0.538 (RPD=0.00)	1	0.173	1	0.618	1	0.297	1	0.368	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.014)	1	BQL(0.015) (RPD=NA)	1	BQL(0.014)	1	BQL(0.010)	1	BQL(0.009)	1	BQL(0.015)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	BQL(0.010)	1	BQL(0.008) (RPD=NA)	1	BQL(0.011)	1	BQL(0.010)	1	BQL(0.010)	1	BQL(0.013)	1
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	16.3	1	16.3 (RPD=0.00)	1	13.0	1	8.86	1	12.6	1	15.9	1
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	21.6	1	21.4 (RPD=0.93)	1	24.2	1	69.0	1	34.5	1	43.3	1
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	0.415	1	0.408 (RPD=1.70)	1	0.973	1	0.164	1	0.291	1	0.363	1
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
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Analytical Service Results Report

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Metals

Report Date:

12/18/06

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Technical Directive:

3ME375HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		PMW-1		PMW-4		ML 2-3		ML 2-5		ML 2-7		ML 2-7	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND	1	0.415	1	ND	1	ND	1	ND (RPD=NA)	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.029	1	0.041	1	0.027	1	0.023	1	0.027	1	0.027 (RPD=0.00)	1
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.246	1	0.233	1	0.694	1	0.175	1	0.194	1	0.198 (RPD=2.04)	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.087	1	0.063	1	0.666	1	0.018	1	0.022	1	0.022 (RPD=0.00)	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	63.8	1	24.8	1	178	1	20.1	1	29.4	1	29.4 (RPD=0.00)	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.008	1	0.004	1	0.027	1	ND	1	ND	1	ND (RPD=NA)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	BQL(0.001)	1	BQL(0.002)	1	0.004	1	ND	1	ND	1	ND (RPD=NA)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	52.2	1	26.7	1	168	1	1.86	1	2.32	1	2.30 (RPD=0.87)	1
Potassium (K)	7440-09-7	mg/L	0.055	0.184	2.78	1	1.91	1	7.64	1	1.01	1	1.64	1	1.67 (RPD=1.81)	1
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	8.13	1	9.52	1	49.7	1	3.06	1	2.86	1	2.85 (RPD=0.35)	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.321	1	0.166	1	1.01	1	0.082	1	0.145	1	0.146 (RPD=0.69)	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.001)	1	BQL(0.002)	1	ND	1	0.004	1	0.007	1	0.007 (RPD=0.00)	1
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	35.9	1	60.5	1	366	1	79.3	1	187	1	186 (RPD=0.54)	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	BQL(0.004)	1	BQL(0.003)	1	0.017	1	BQL(0.002)	1	ND	1	ND (RPD=NA)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.006)	1	BQL(0.006)	1	BQL(0.010)	1	BQL(0.005)	1	BQL(0.007)	1	BQL(0.007) (RPD=NA)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	ND	1	0.013	1	ND	1	0.018	1	0.018	1	0.019 (RPD=5.41)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.250	1	0.142	1	2.17	1	0.198	1	0.384	1	0.379 (RPD=1.31)	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.001)	1	ND	1	BQL(0.002)	1	ND	1	ND	1	ND (RPD=NA)	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.013)	1	BQL(0.005)	1	BQL(0.010)	1	BQL(0.006)	1	BQL(0.013)	1	BQL(0.012) (RPD=NA)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	BQL(0.003)	1	BQL(0.002)	1	BQL(0.007)	1	ND	1	ND	1	ND (RPD=NA)	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	0.043	1	BQL(0.018)	1	BQL(0.006)	1	BQL(0.007)	1	BQL(0.009) (RPD=NA)	1
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	6.79	1	11.8	1	11.7	1	15.4	1	15.8	1	15.9 (RPD=0.63)	1
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	7.09	1	33.6	1	ND	1	16.1	1	34.4	1	35.1 (RPD=2.01)	1
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	0.301	1	0.577	1	0.123	1	1.69	1	0.284	1	0.285 (RPD=0.35)	1
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. "-" denotes that the information is not available or the analyte is not analyzed.

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Analytical Service Results Report

Laboratory:

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12/18/06

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Technical Directive:

3ME375HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		PMW-5		PMW-6		DUPLICATE-2 (PMW-5)		ML 7-3		ML 7-5		ML 7-7	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.020	1	0.029	1	0.019	1	0.075	1	0.023	1	0.030	1
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.321	1	0.189	1	0.324	1	0.369	1	0.214	1	0.205	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.057	1	0.029	1	0.057	1	0.118	1	0.036	1	0.018	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	34.5	1	46.6	1	35.1	1	36.5	1	32.5	1	25.2	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.008	1	BQL(0.003)	1	0.008	1	0.009	1	BQL(0.001)	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	BQL(0.001)	1	ND	1	BQL(0.001)	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	52.5	1	17.7	1	52.6	1	58.6	1	9.32	1	2.82	1
Potassium (K)	7440-09-7	mg/L	0.055	0.184	3.03	1	3.34	1	3.07	1	2.19	1	1.34	1	1.58	1
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	7.53	1	5.37	1	7.68	1	18.6	1	5.71	1	3.36	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.173	1	0.147	1	0.174	1	0.217	1	0.177	1	0.148	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	BQL(0.003)	1	ND	1	BQL(0.002)	1	BQL(0.003)	1	BQL(0.004)	1
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	54.8	1	54.9	1	55.4	1	305	1	101	1	198	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	0.101	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	BQL(0.006)	1	ND	1	BQL(0.005)	1	BQL(0.006)	1	ND	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.004)	1	BQL(0.006)	1	BQL(0.005)	1	0.012	1	BQL(0.006)	1	BQL(0.009)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	ND	1	0.014	1	ND	1	0.027	1	0.020	1	0.028	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.165	1	0.178	1	0.167	1	0.460	1	0.383	1	0.267	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.005)	1	BQL(0.015)	1	BQL(0.007)	1	ND	1	BQL(0.007)	1	BQL(0.007)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	BQL(0.002)	1	BQL(0.003)	1	BQL(0.003)	1	BQL(0.005)	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	BQL(0.009)	1	ND	1	ND	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	16.6	1	14.0	1	16.7	1	10.9	1	19.0	1	15.8	1
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	3.38	1	10.4	1	3.04	1	22.0	1	1.42	1	9.61	1
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	1.20	1	1.07	1	1.20	1	0.044	1	0.963	1	0.217	1
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

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Analytical Service Results Report

Laboratory:

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12/18/06

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Technical Directive:

3ME375HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML 3-3		ML 3-5		ML 3-7							
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1						
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	0.127	1	ND	1						
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.021	1	0.017	1	0.020	1						
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.707	1	0.285	1	0.273	1						
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.211	1	0.153	1	0.120	1						
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1						
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	136	1	82.3	1	75.6	1						
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.034	1	0.008	1	0.007	1						
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	0.004	1	BQL(0.001)	1	ND	1						
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1						
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1						
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	212	1	50.8	1	45.0	1						
Potassium (K)	7440-09-7	mg/L	0.055	0.184	5.60	1	2.57	1	1.82	1						
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	63.2	1	14.8	1	9.87	1						
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.713	1	0.434	1	0.533	1						
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1						
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	255	1	85.4	1	112	1						
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1						
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	0.023	1	BQL(0.005)	1	BQL(0.006)	1						
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.006)	1	BQL(0.006)	1	BQL(0.009)	1						
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	ND	1	ND	1	ND	1						
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	1.82	1	0.608	1	0.646	1						
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.001)	1	0.005	1	ND	1						
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1	0.017	1	0.020	1						
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	ND	1	BQL(0.002)	1	ND	1						
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	ND	1	ND	1						
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	4.86	1	16.3	1	18.3	1						
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	ND	1	ND	1	1.31	1						
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	0.092	1	1.09	1	0.825	1						
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1						

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

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Analytical Report - Analytical Results

Laboratory: IRMS

Report Date: 12/22/06

Tech Dir: 30A920HW

Date Analyzed: 12/12-20/2006

Method: RSKSOP-296 in Progress

Date Received: 12/06/06

Analyst: Feng Lu

Field Sample ID	IRMS Tracking ID	Lab ID	1000 $\delta^2\text{H}_{\text{VSMOW}}$			1000 $\delta^{18}\text{O}_{\text{VSMOW}}$		
			Measured	Mean	Stdev	Measured	Mean	Stdev
ML2-3 (12/1/06)	3644-0021	3644-4	-24.46			-6.08		
	3644-0022	3644-4D	-17.05			-4.71		
	3644-0023	3644-4D	-17.57			-4.43		
	3644-0024	3644-4D	-16.59			-4.24		
	3644-0025	3644-4D	-15.64			-4.02		
	3644-0026	3644-4D	-15.57	-15.60	0.05	-4.04	-4.03	0.01
ML2-5 (12/1/06)	3644-0027	3644-5	-17.90			-3.82		
	3644-0028	3644-5D	-16.92			-3.68		
	3644-0029	3644-5D	-16.52			-3.52		
	3644-0030	3644-5D	-16.13	-16.33	0.28	-3.37	-3.44	0.10
ML5-3 (11/29/06)	3644-0031	3644-6	-18.70			-3.41		
	3644-0032	3644-6D	-18.55			-3.36		
	3644-0033	3644-6D	-18.19			-3.47		
	3644-0034	3644-6D	-18.62	-18.40	0.30	-3.25	-3.36	0.16
ML5-5 (11/29/06)	3644-0035	3644-7	-15.35			-3.46		
	3644-0036	3644-7D	-14.51			-3.04		
	3644-0037	3644-7D	-15.12			-3.37		
	3644-0038	3644-7D	-14.87	-14.99	0.18	-3.23	-3.30	0.10
Dup1 (ML5-5) (Duplicate 1; 11/29/06)	3644-0045	3644-9	-24.67			-7.92		
	3644-0046	3644-9D	-16.68			-4.76		
	3644-0047	3644-9D	-15.23			-4.29		
	3644-0048	3644-9D	-15.46			-3.77		
	3644-0049	3644-9D	-15.29			-3.54		
	3644-0050	3644-9D	-14.55	-14.92	0.52	-3.71	-3.62	0.12
PMW-3 (11/29/06)	3644-0051	3644-10	-17.27			-3.34		
	3644-0052	3644-10D	-16.29			-3.61		
	3644-0053	3644-10D	-17.99			-3.33		
	3644-0054	3644-10D	-17.07	-17.53	0.65	-3.42	-3.37	0.07
PMW-5 (12/2/06)	3644-0055	3644-11	-17.45			-4.22		
	3644-0056	3644-11D	-15.46			-2.63		
	3644-0057	3644-11D	-16.12			-3.74		
	3644-0058	3644-11D	-16.06	-16.09	0.04	-3.03	-3.38	0.50
Dup2 (PMW-5) (Duplicate 2; 12/2/06)	3644-0059	3644-12	-17.61			-3.44		
	3644-0060	3644-12D	-16.55			-3.27		
	3644-0061	3644-12D	-16.29			-3.34		

Analytical Report - Analytical Results

Laboratory: IRMS

Report Date: 12/22/06

Tech Dir: 30A920HW

Date Analyzed: 12/12-20/2006

Method: RSKSOP-296 in Progress

Date Received: 12/06/06

Analyst: Feng Lu

Field Sample ID	IRMS Tracking ID	Lab ID	1000 $\delta^2\text{H}_{\text{VSMOW}}$			1000 $\delta^{18}\text{O}_{\text{VSMOW}}$		
			Measured	Mean	Stdev	Measured	Mean	Stdev
	3644-0062	3644-12D	-16.09	-16.19	0.14	-3.40	-3.37	0.04

Comments:

Due to memory effect, typically the first two to four replicates (*italic*) of each sample were excluded from the calculations for the average (mean) and the standard deviation (stdev).

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

01/25/07

Technical Directive:

3GP952HW

Sample Results (1, 2)

Analyst:

Vanessa Scroggins

			Analytes	Nitrite+Nitrate-Nitrogen(NO ₂ +NO ₃ -N)					
			Codes	00630					
			Methods	FIA 10-107-04-2-A					
			Unit	mg/L					
			MDL	0.009					
			QL	0.100					
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF
FIELD BLANK	3703-1	1/19/2007	1/24/2007	ND	1				
PMW-3	3703-2	1/19/2007	1/24/2007	BQL (0.048)	1				
PMW-5	3703-3	1/19/2007	1/24/2007	BQL (0.050)	1				
PMW-5	3703-3 LAB DUP	1/19/2007	1/24/2007	BQL (0.050) (RPD=NA)	1				
PMW-6	3703-4	1/19/2007	1/24/2007	BQL (0.047)	1				
PMW-1	3703-5	1/19/2007	1/24/2007	BQL (0.015)	1				
DUPLICATE 1	3703-6	1/19/2007	1/24/2007	BQL (0.046)	1				
ML1-2	3703-7	1/20/2007	1/24/2007	BQL (0.033)	1				
ML1-4	3703-8	1/20/2007	1/24/2007	BQL (0.009)	1				
ML1-6	3703-9	1/20/2007	1/24/2007	ND	1				
ML2-2	3703-10	1/20/2007	1/24/2007	BQL (0.045)	1				
ML2-2	3703-10 LAB DUP	1/20/2007	1/24/2007	BQL (0.048) (RPD=NA)	1				
ML2-3	3703-11	1/20/2007	1/24/2007	BQL (0.077)	1				
ML2-4	3703-12	1/21/2007	1/24/2007	BQL (0.050)	1				
ML2-5	3703-13	1/21/2007	1/24/2007	BQL (0.009)	1				
ML2-6	3703-14	1/21/2007	1/24/2007	ND	1				
ML3-2	3703-15	1/21/2007	1/24/2007	BQL (0.055)	1				
ML3-3	3703-16	1/21/2007	1/24/2007	BQL (0.044)	1				
ML3-4	3703-17	1/21/2007	1/24/2007	BQL (0.022)	1				
ML3-6	3703-18	1/21/2007	1/24/2007	BQL (0.050)	1				
ML3-6	3703-18 LAB DUP	1/21/2007	1/24/2007	BQL (0.052) (RPD=NA)	1				
ML3-7	3703-19	1/22/2007	1/24/2007	BQL (0.025)	1				

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set, that are within the calibration range.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable. **NA** - not applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

01/30/07

Technical Directive:

3GP952HW

Sample Results (1)

Analyst:

Vanessa Scroggins

			Analytes	Nitrite+Nitrate-Nitrogen(NO ₂ +NO ₃ -N)					
			Codes	00630					
			Methods	FIA 10-107-04-2-A					
			Unit	mg/L					
			MDL	0.009					
			QL	0.100					
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF
ML4-2	3712-1	1/22/2007	1/29/2007	BQL (0.030)	1				
ML4-4	3712-2	1/23/2007	1/29/2007	BQL (0.052)	1				
ML4-4	3712-2 LAB DUP	1/23/2007	1/29/2007	BQL (0.049) (RPD=NA)	1				
ML4-6	3712-3	1/23/2007	1/29/2007	BQL (0.047)	1				
ML5-2	3712-4	1/23/2007	1/29/2007	BQL (0.055)	1				
ML5-4	3712-5	1/23/2007	1/29/2007	0.112	1				
ML5-6	3712-6	1/23/2007	1/29/2007	BQL (0.054)	1				
DUPLICATE 2	3712-7	1/23/2007	1/29/2007	BQL (0.058)	1				
ML6-2	3712-8	1/23/2007	1/29/2007	BQL (0.061)	1				
ML6-4	3712-9	1/24/2007	1/29/2007	BQL (0.065)	1				
ML6-6	3712-10	1/24/2007	1/29/2007	BQL (0.078)	1				
ML6-6	3712-10 LAB DUP	1/24/2007	1/29/2007	BQL (0.076) (RPD=NA)	1				
ML7-2	3712-11	1/24/2007	1/29/2007	0.132	1				
ML7-3	3712-12	1/24/2007	1/29/2007	BQL (0.055)	1				
ML7-4	3712-13	1/25/2007	1/29/2007	BQL (0.058)	1				
ML7-5	3712-14	1/25/2007	1/29/2007	BQL (0.057)	1				
ML7-6	3712-15	1/25/2007	1/29/2007	BQL (0.057)	1				
ML7-6	3712-15 LAB DUP	1/25/2007	1/29/2007	BQL (0.061) (RPD=NA)	1				
ML7-7	3712-16	1/25/2007	1/29/2007	BQL (0.062)	1				
DUPLICATE 3	3712-17	1/25/2007	1/29/2007	BQL (0.081)	1				

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set, that are within the calibration range.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable. **NA** - not applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **General Parameters**

Report Date: **02/12/07**

Technical Directive: **3GP952HW**

Analyst: **Kristie Hargrove**

Analytes	Total Inorganic Carbon (TIC)	Total Organic Carbon (TOC)	Total Organic Carbon (TOC)
Codes	7440-44-0-TIC	7440-44-0-TOC	7440-44-0-TOC
Methods	RSKSOP-265 Rev. 2	RSKSOP-265 Rev. 2	RSKSOP-265 Rev. 2
Unit	mg/L	mg/L	mg/L
MDL	0.018*	0.025*	0.062*
QL	0.100*	20.0*	0.100*

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF
ML4-2	3712-1	1/22/2007	1/31-2/7/07	30.5 (±0.0496)	8	569 (±1.0638)	8	-	-
ML4-4	3712-2	1/23/2007	1/31-2/7/07	62.2 (±0.0898)	8	33.9 (±0.6829)	1	-	-
ML4-6	3712-3	1/23/2007	1/31-2/7/07	54.5 (±0.0686)	8	-	-	12.2 (±0.0267)	4
ML4-6	3712-3 LAB DUP	1/23/2007	1/31-2/7/07	-	-	-	-	12.1(±0.0062)(RPD=0.823)	4
ML5-2	3712-4	1/23/2007	1/31-2/7/07	46.0 (±0.0436)	8	259 (±0.3820)	8	-	-
ML5-4	3712-5	1/23/2007	1/31-2/7/07	21.9 (±0.0349)	8	224 (±0.3217)	8	-	-
ML5-6	3712-6	1/23/2007	1/31-2/7/07	30.5 (±0.0328)	8	205 (±0.1095)	8	-	-
DUPLICATE 2	3712-7	1/23/2007	1/31-2/7/07	24.1 (±0.0323)	8	222 (±0.1950)	8	-	-
ML6-2	3712-8	1/23/2007	1/31-2/7/07	55.1 (±0.0228)	8	239 (±0.2709)	8	-	-
ML6-2	3712-8 LAB DUP	1/23/2007	1/31-2/7/07	60.3 (±0.0629) (RPD=9.01)	8	235 (±0.1503) (RPD=1.69)	8	-	-
ML6-4	3712-9	1/24/2007	1/31-2/7/07	53.6 (±0.0800)	8	66.4 (±0.3382)	1	-	-
ML6-6	3712-10	1/24/2007	1/31-2/7/07	45.1 (±0.0201)	8	54.5 (±0.2651)	1	-	-
ML7-2	3712-11	1/24/2007	1/31-2/7/07	9.51 (±0.0102)	8	1150 (±2.2338)	8	-	-
ML7-3	3712-12	1/24/2007	1/31-2/7/07	89.5 (±0.2098)	8	243 (±0.3099)	8	-	-
ML7-4	3712-13	1/24/2007	1/31-2/7/07	55.6 (±0.0371)	8	118 (±0.3130)	4	-	-
ML7-5	3712-14	1/25/2007	1/31-2/7/07	21.5 (±0.0019)	8	212 (±0.5417)	8	-	-
ML7-6	3712-15	1/25/2007	1/31-2/7/07	61.6 (±0.0721)	8	174 (±0.1518)	8	-	-
ML7-7	3712-16	1/25/2007	1/31-2/7/07	66.6 (±0.0465)	8	111 (±0.2004)	4	-	-
DUPLICATE 3	3712-17	1/25/2007	1/31-2/7/07	73.1 (±0.0596)	8	111 (±0.0776)	4	-	-

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set. *MDL and QL should be raised by the same factor as the dilution factor for those samples that were diluted. Due to the wide range of TOC concentrations in samples containing degraded corn oil, some samples were analyzed at a mid-calibration range and at a low-calibration range as is described in RSKSOP-265/2.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (DF), if applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **General Parameters**

Report Date: **02/05/07**

Technical Directive: **3GP952HW**

Analyst:	Kristie Hargrove		Analytes	Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)		Total Organic Carbon (TOC)	
			Codes	7440-44-0-TIC		7440-44-0-TOC		7440-44-0-TOC	
			Methods	RSKSOP-265 Rev. 2		RSKSOP-265 Rev. 2		RSKSOP-265 Rev. 2	
			Unit	mg/L		mg/L		mg/L	
			MDL	0.018**		0.25**		0.062**	
			QL	0.100**		20.0**		0.100**	
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF
Field Blank	3703-1	1/19/2007	1/25-2/4/07	0.411 (± 0.0022)	1	-	-	BQL (0.238) (± 0.0225)	4
PMW-3	3703-2	1/19/2007	1/25-2/4/07	46.3 (± 0.0721)	4	80.7 (±0.7417)	4	-	-
PMW-5	3703-3	1/19/2007	1/25-2/4/07	25.2 (± 0.0054)	4	208 (±0.3751)	4	-	-
PMW-6	3703-4	1/19/2007	1/25-2/4/07	64.6 (± 0.1071)	4	50.8 (±0.2618)	1	-	-
PMW-1	3703-5	1/19/2007	1/25-2/4/07	55.5 (± 0.0427)	4	178 (±0.4852)	4	-	-
DUPLICATE 1	3703-6	1/19/2007	1/25-2/4/07	62.4 (± 0.1232)	4	53.0 (±0.8189)	1	-	-
ML1-2	3703-7	1/20/2007	1/25-2/4/07	81.5 (± 0.1477)	8	41.8 (±1.4818)	1	-	-
ML1-4	3703-8	1/20/2007	1/25-2/4/07	100 (± 0.1701)	8	40.1 (±0.4677)	1	-	-
ML1-6	3703-9	1/20/2007	1/25-2/4/07	58.9 (± 0.0602)	4	-	-	16.2 (±0.0458)	4
ML1-6	3703-9 LAB DUP	1/20/2007	1/25-2/4/07	-	-	-	-	16.4 (±0.0084) (RPD=1.23)	4
ML2-2	3703-10	1/20/2007	1/25-2/4/07	34.9 (± 0.0644)	4	272 (±0.4719)	4	-	-
ML2-2	3703-10 LAB DUP	1/20/2007	1/25-2/4/07	34.3 (± 0.0898) (RPD = 1.73)	4	274(±0.2370) (RPD=0.733)	4	-	-
ML2-3	3703-11	1/20/2007	1/25-2/4/07	12.6 (± 0.0099)	4	1120 (±1.9207)	10	-	-
ML2-4	3703-12	1/21/2007	1/25-2/4/07	91.8 (± 0.1157)	8	54.0 (±2.5719)	1	-	-
ML2-5	3703-13	1/21/2007	1/25-2/4/07	65.8 (± 0.2259)	4	-	-	14.7 (±0.0382)	2
ML2-6	3703-14	1/21/2007	1/25-2/4/07	74.5 (± 0.1797)	4	-	-	21.8 (±0.2152)	4
ML3-2	3703-15	1/21/2007	1/25-2/4/07	7.08 (± 0.0481)	4	2460 (±2.2082)	20	-	-
ML3-3	3703-16	1/21/2007	1/25-2/4/07	2.17 (± 0.0039)	4	1570 (±3.7769)	10	-	-
ML3-4	3703-17	1/21/2007	1/25-2/4/07	41.8 (± 0.0610)	4	263 (±0.4555)	4	-	-
ML3-6	3703-18	1/21/2007	1/25-2/4/07	15.7 (± 0.0556)	4	862 (±1.2476)	10	-	-
ML3-7	3703-19	1/22/2007	1/25-2/4/07	54.1 (± 0.1279)	4	529 (±1.7161)	4	-	-

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set. The data values are reported with the dilution factors applied. Due to the wide range of TOC concentrations in samples containing degraded corn oil, the samples were analyzed at a mid-calibration range and at a low-calibration range as is described in RSKSOP-265/2.

Notes:

** The MDL and QL should be raised by the same factor as the dilution factor in the samples that were diluted.

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the
2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **General Parameters** Report Date: **01/26/07**

Technical Directive: **3GP952HW**

Analyst: **Lynda Callaway**

Analytes	Chloride (Cl)	Bromide (Br)	Nitrite-N (NO ₂ -N)	Sulfate (as SO ₄)	Nitrate-N (NO ₃ -N)	Fluoride (F)
Codes	16887-00-6	7726-95-6-BR	14797-65-0	14808-79-8	14797-55-8	7782-41-4
Methods	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288
Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MDL	* 0.263	0.080	0.098	* 0.298	0.066	0.095
QL	* 1.00	1.00	0.200	* 1.00	0.200	1.00

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Field Blank	3703-1	1/19/2007	1/24/2007	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
PMW-3	3703-2	1/19/2007	1/24/2007	95.1	11	BQL (0.895)	1	ND	1	4.68	1	ND	1	ND	1
PMW-5	3703-3	1/19/2007	1/24/2007	182	11	BQL (0.867)	1	ND	1	BQL (0.795)	1	ND	1	ND	1
PMW-6	3703-4	1/19/2007	1/24/2007	45.4	1	BQL (0.528)	1	ND	1	25.1	1	ND	1	ND	1
PMW-1	3703-5	1/19/2007	1/24/2007	58.8	11	ND	1	ND	1	7.98	1	ND	1	ND	1
Duplicate 1	3703-6	1/19/2007	1/24/2007	45.1	1	BQL (0.529)	1	ND	1	24.6	1	ND	1	BQL (0.119)	1
ML 1-2	3703-7	1/20/2007	1/24/2007	167	11	BQL (0.175)	1	ND	1	287	11	ND	1	ND	1
ML 1-4	3703-8	1/20/2007	1/24/2007	74.2	11	1.37	1	ND	1	102	11	ND	1	BQL (0.255)	1
ML 1-6	3703-9	1/20/2007	1/24/2007	104	11	BQL (0.112)	1	ND	1	114	11	ND	1	BQL (0.142)	1
ML 2-2	3703-10	1/20/2007	1/24/2007	364	11	BQL (0.152)	1	ND	1	2.18	1	ND	1	ND	1
ML 2-2	3703-10 Lab dup	1/20/2007	1/24/2007	378 (RPD=3.77)	11	BQL (0.176)(RPD=NA)	1	ND (RPD=NA)	1	2.10 (RPD=3.74)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
ML 2-3	3703-11	1/20/2007	1/24/2007	883	21	ND	1	ND	1	BQL (0.441)	1	ND	1	ND	1
ML 2-4	3703-12	1/21/2007	1/24/2007	156	11	BQL (0.644)	1	ND	1	23.2	1	ND	1	BQL (0.261)	1
ML 2-5	3703-13	1/21/2007	1/24/2007	32.6	1	BQL (0.646)	1	ND	1	36.5	1	ND	1	BQL (0.179)	1
ML 2-6	3703-14	1/21/2007	1/24/2007	54.7	11	BQL (0.659)	1	ND	1	54.0	11	ND	1	BQL (0.200)	1
ML 3-2	3703-15	1/21/2007	1/24/2007	244	11	2.76	1	ND	1	2.60	1	ND	1	ND	1
ML 3-3	3703-16	1/21/2007	1/24/2007	119	11	BQL (0.523)	1	ND	1	BQL (0.870)	1	ND	1	BQL (0.157)	1
ML 3-4	3703-17	1/21/2007	1/24/2007	31.8	1	BQL (0.578)	1	ND	1	10.8	1	ND	1	BQL (0.168)	1
ML 3-6	3703-18	1/21/2007	1/24/2007	73.9	11	1.95	1	ND	1	BQL (0.553)	1	ND	1	BQL (0.106)	1
ML 3-7	3703-19	1/22/2007	1/24/2007	90.9	11	BQL (0.793)	1	ND	1	ND	1	ND	1	BQL (0.095)	1
ML 3-7	3703-19 Lab dup	1/22/2007	1/24/2007	93.6 (RPD=2.93)	11	BQL (0.807)(RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1	BQL(0.104)(RPD=NA)	1

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set within the calibration range. *MDL and QL should be raised by the same factor as the dilution factor for those samples that were diluted.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (**DF**), if applicable.
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Shaw Environmental, Inc.
Analytical Service Results Report

Page 1 of 8

RSKSOP 213(2)

Analysts:	S. Markham/S. Saye		Field Sample ID		FIELD BLANK		PMW-3		PMW-5		PMW-6		PMW-1		DUPLICATE 1		
			Sample Lab ID		3703-01		3703-02		3703-03		3703-04		3703-05		3703-06		
			Date Collected		1/19/07		1/19/07		1/19/07		1/19/07		1/19/07		1/19/07		
			Date Analyzed		1/31/07		1/31/07		1/31/07		1/31/07		1/31/07		1/31/07		
Method:	RSKSOP 213(2)																
	Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
	Names	Codes															
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	ND	1	BQL(0.067)	1	BQL(0.055)	1	ND	1	0.329	1	ND	1	
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	ND	1	0.040	1	BQL(0.006)	1	BQL(0.011)	1	BQL(0.019)	1	BQL(0.013)	1	
Boron (B)	7440-42-8	mg/L	0.014	0.049	ND	1	0.230	1	0.374	1	0.175	1	0.321	1	0.172	1	
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	ND	1	0.046	1	0.085	1	0.028	1	0.105	1	0.025	1	
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	BQL(0.073)	1	32.0	1	55.2	1	43.8	1	65.3	1	44.3	1	
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	BQL(0.002)	1	0.010	1	BQL(0.002)	1	0.012	1	BQL(0.002)	1	
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	BQL(0.001)	1	ND	1	ND	1	ND	1	
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND	1	BQL(0.007)	1	ND	1	ND	1	
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	BQL(0.017)	1	16.6	1	72.5	1	15.3	1	90.5	1	14.4	1	
Potassium (K)	7440-09-7	mg/L	0.061	0.204	ND	1	1.90	1	3.43	1	3.11	1	3.05	1	3.08	1	
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	ND	1	11.1	1	13.4	1	6.03	1	8.99	1	6.09	1	
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	ND	1	0.120	1	0.270	1	0.175	1	0.355	1	0.178	1	
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	BQL(0.003)	1	ND	1	BQL(0.003)	1	ND	1	BQL(0.002)	1	
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	0.175	1	73.6	1	63.1	1	58.3	1	38.2	1	59.2	1	
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	BQL(0.003)	1	BQL(0.007)	1	0.013	1	BQL(0.007)	1	0.012	1	BQL(0.007)	1	
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.005)	1	BQL(0.008)	1	BQL(0.008)	1	BQL(0.007)	1	BQL(0.008)	1	BQL(0.008)	1	
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.004)	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	ND	1	0.173	1	0.277	1	0.177	1	0.269	1	0.179	1	
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.002)	1	BQL(0.001)	1	BQL(0.002)	1	0.008	1	ND	1	
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	ND	1	BQL(0.012)	1	BQL(0.010)	1	BQL(0.018)	1	BQL(0.012)	1	BQL(0.016)	1	
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1	ND	1	BQL(0.005)	1	ND	1	BQL(0.005)	1	ND	1	
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	ND	1	ND	1	BQL(0.009)	1	ND	1	BQL(0.011)	1	
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	BQL(0.111)	1	17.9	1	22.2	1	14.1	1	5.94	1	14.0	1	
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND	1	2.70	1	3.49	1	9.23	1	2.65	1	8.69	1	
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	ND	1	1.04	1	0.946	1	0.760	1	0.182	1	0.541	1	
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. "—" denotes that the information is not available or the analyte is not analyzed.

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analysts:	S. Markham/S. Saye		Field Sample ID		DUPLICATE 1		ML 1-2		ML 1-4		ML 1-4		ML 1-6		ML 2-2		
			Sample Lab ID		3703-06 Lab Dup.		3703-07		3703-08		3703-08 Lab Dup.*		3703-09		3703-10		
			Date Collected		1/19/07		1/20/07		1/20/07		1/20/07		1/20/07		1/20/07		
			Date Analyzed		1/31/07		1/31/07		1/31/07		1/31/07		1/31/07		1/31/07		
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																
	Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
	Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	ND (RPD=NA)	1	0.188	1	0.206	1	0.211 (RPD=2.40)	1	ND	1	ND	1
	Arsenic (As)	7440-38-2	mg/L	0.006	0.019	BQL(0.017) (RPD=NA)	1	0.021	1	BQL(0.013)	1	BQL(0.014) (RPD=NA)	1	BQL(0.011)	1	BQL(0.012)	1
	Boron (B)	7440-42-8	mg/L	0.014	0.049	0.175 (RPD=1.73)	1	0.274	1	0.202	1	0.204 (RPD=0.99)	1	0.170	1	0.565	1
	Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.025 (RPD=0.00)	1	0.218	1	0.046	1	0.046 (RPD=0.00)	1	0.033	1	0.204	1
	Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
	Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	44.4 (RPD=0.23)	1	96.0	1	38.3	1	38.4 (RPD=0.26)	1	28.3	1	75.8	1
	Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.002) (RPD=NA)	1	0.008	1	BQL(0.003)	1	ND (RPD=NA)	1	ND	1	0.022	1
	Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.001)	1
	Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
	Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
	Iron (Fe)	7439-89-6	mg/L	0.006	0.019	14.4 (RPD=0.00)	1	59.3	1	8.38	1	8.44 (RPD=0.71)	1	0.114	1	158	1
	Potassium (K)	7440-09-7	mg/L	0.061	0.204	3.09 (RPD=0.32)	1	5.02	1	1.72	1	1.72 (RPD=0.00)	1	1.42	1	1.53	1
	Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	6.06 (RPD=0.49)	1	17.4	1	8.49	1	8.39 (RPD=1.18)	1	5.97	1	39.4	1
	Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.181 (RPD=1.67)	1	0.760	1	0.197	1	0.198 (RPD=0.51)	1	0.063	1	0.651	1
	Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002) (RPD=NA)	1	BQL(0.001)	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1	0.008	1	ND	1
	Sodium (Na)	7440-23-5	mg/L	0.047	0.155	59.5 (RPD=0.51)	1	162	1	184	1	184 (RPD=0.00)	1	143	1	79.7	1
	Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
	Lead (Pb)	7439-92-1	mg/L	0.002	0.008	BQL(0.006) (RPD=NA)	1	0.012	1	BQL(0.005)	1	BQL(0.006) (RPD=NA)	1	BQL(0.005)	1	0.024	1
	Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.008) (RPD=NA)	1	0.013	1	0.012	1	BQL(0.008) (RPD=NA)	1	BQL(0.008)	1	BQL(0.009)	1
	Selenium (Se)	7782-49-2	mg/L	0.003	0.011	ND (RPD=NA)	1	ND	1	ND	1	BQL(0.006) (RPD=NA)	1	ND	1	ND	1
	Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.179 (RPD=0.00)	1	0.475	1	0.475	1	0.477 (RPD=0.42)	1	0.143	1	0.494	1
	Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND (RPD=NA)	1	0.005	1	0.006	1	0.007 (RPD=15.38)	1	BQL(0.002)	1	BQL(0.002)	1
	Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.017) (RPD=NA)	1	0.026	1	BQL(0.015)	1	BQL(0.018) (RPD=NA)	1	BQL(0.012)	1	BQL(0.006)	1
	Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.003) (RPD=NA)	1	BQL(0.004)	1	ND	1	BQL(0.004) (RPD=NA)	1	0.020	1	BQL(0.006)	1
	Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	BQL(0.013) (RPD=NA)	1	BQL(0.007)	1	BQL(0.014)	1	BQL(0.012) (RPD=NA)	1	BQL(0.015)	1	ND	1
	Sillicon (Si)	7440-21-3	mg/L	0.049	0.163	14.1 (RPD=0.71)	1	6.26	1	12.2	1	12.4 (RPD=1.63)	1	16.7	1	10.5	1
	Sulfur (S)	7704-34-9	mg/L	0.102	0.341	8.73 (RPD=0.46)	1	89.1	1	31.5	1	30.7 (RPD=2.57)	1	33.6	1	ND	1
	Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.539 (RPD=0.37)	1	0.090	1	0.559	1	0.562 (RPD=0.54)	1	0.060	1	0.109	1
	Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND (RPD=NA)	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. * -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML 2-3		ML 2-4		ML 2-5		ML 2-6		ML 2-6		ML 3-2	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	BQL(0.070)	1	BQL(0.075)	1	0.166	1	3.40	1	3.44 (RPD=1.17)	1	3.57	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	BQL(0.016)	1	BQL(0.015)	1	BQL(0.007)	1	BQL(0.010)	1	BQL(0.007) (RPD=NA)	1	0.022	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.915	1	0.240	1	0.169	1	0.173	1	0.173 (RPD=0.00)	1	1.39	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	1.16	1	0.064	1	0.021	1	0.025	1	0.025 (RPD=0.00)	1	1.76	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	276	1	44.2	1	24.5	1	23.3	1	23.4 (RPD=0.43)	1	247	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.041	1	BQL(0.002)	1	ND	1	ND	1	ND (RPD=NA)	1	0.067	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	BQL(0.004)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	0.008	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	0.005	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	278	1	10.7	1	1.86	1	1.42	1	1.43 (RPD=0.70)	1	433	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	4.39	1	1.47	1	1.05	1	1.42	1	1.42 (RPD=0.00)	1	204	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	82.0	1	11.1	1	3.40	1	4.39	1	4.47 (RPD=1.81)	1	83.4	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	1.68	1	0.198	1	0.103	1	0.097	1	0.096 (RPD=1.04)	1	1.31	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	BQL(0.004)	1	BQL(0.004)	1	BQL(0.004)	1	0.005 (RPD=NA)	1	ND	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	419	1	168	1	67.8	1	108	1	110 (RPD=1.83)	1	662	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	0.036	1	BQL(0.006)	1	BQL(0.006)	1	BQL(0.008)	1	BQL(0.008) (RPD=NA)	1	0.053	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.009)	1	0.012	1	BQL(0.011)	1	BQL(0.006)	1	BQL(0.008) (RPD=NA)	1	BQL(0.011)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	ND	1	ND	1	BQL(0.007)	1	ND	1	ND (RPD=NA)	1	ND	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	3.59	1	0.433	1	0.250	1	0.171	1	0.173 (RPD=1.16)	1	5.18	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.003)	1	0.005	1	0.081	1	0.082 (RPD=1.23)	1	0.079	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.009)	1	0.022	1	BQL(0.008)	1	BQL(0.017)	1	BQL(0.017) (RPD=NA)	1	ND	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.008)	1	BQL(0.003)	1	BQL(0.003)	1	0.021	1	0.020 (RPD=4.88)	1	0.011	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	BQL(0.009)	1	BQL(0.010)	1	BQL(0.011)	1	BQL(0.012) (RPD=NA)	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	11.0	1	16.9	1	16.4	1	20.4	1	20.5 (RPD=0.49)	1	10.4	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND	1	7.15	1	11.6	1	17.0	1	17.0 (RPD=0.00)	1	ND	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.278	1	0.322	1	1.48	1	0.505	1	0.504 (RPD=0.20)	1	0.179	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	BQL(0.015)	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
- " - " denotes that the information is not available or the analyte is not analyzed.

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Field Sample ID		ML 3-2		ML 3-3		ML 3-4		ML 3-6		ML 3-6		ML 3-7	
Sample Lab ID		3703-15 Lab Dup.*		3703-16		3703-17		3703-18		3703-18 Lab Dup.		3703-19	
Date Collected		1/21/07		1/21/07		1/21/07		1/21/07		1/21/07		1/22/07	
Date Analyzed		1/31/07		1/31/07		1/31/07		1/31/07		1/31/07		1/31/07	
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.003	0.011	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
0.040	0.133	3.22 (RPD=10.31)	1	BQL(0.083)	1	BQL(0.126)	1	ND	1	ND (RPD=NA)	1	0.652	1
0.006	0.019	0.021 (RPD=4.65)	1	0.033	1	BQL(0.011)	1	BQL(0.013)	1	BQL(0.010) (RPD=NA)	1	0.019	1
0.014	0.049	1.37 (RPD=1.45)	1	1.13	1	0.284	1	1.05	1	1.04 (RPD=0.96)	1	0.491	1
0.001	0.004	1.76 (RPD=0.00)	1	0.479	1	0.056	1	0.134	1	0.134 (RPD=0.00)	1	0.180	1
0.001	0.004	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
0.027	0.089	247 (RPD=0.00)	1	205	1	43.4	1	116	1	116 (RPD=0.00)	1	106	1
0.001	0.004	0.066 (RPD=1.50)	1	0.057	1	0.007	1	0.048	1	0.048 (RPD=0.00)	1	0.019	1
0.001	0.004	0.008 (RPD=0.00)	1	0.006	1	ND	1	0.007	1	0.006 (RPD=15.38)	1	BQL(0.002)	1
0.001	0.004	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
0.006	0.019	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
0.006	0.019	430 (RPD=0.70)	1	383	1	55.9	1	327	1	326 (RPD=0.31)	1	139	1
0.061	0.204	205 (RPD=0.49)	1	6.87	1	6.81	1	2.88	1	2.72 (RPD=5.71)	1	2.17	1
0.027	0.089	83.0 (RPD=0.48)	1	96.1	1	10.6	1	25.4	1	25.3 (RPD=0.39)	1	16.8	1
0.001	0.004	1.31 (RPD=0.00)	1	1.09	1	0.229	1	1.09	1	1.09 (RPD=0.00)	1	0.828	1
0.001	0.004	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
0.047	0.155	671 (RPD=1.35)	1	251	1	67.1	1	117	1	116 (RPD=0.86)	1	123	1
0.003	0.011	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
0.002	0.008	0.054 (RPD=1.87)	1	0.049	1	0.015	1	0.041	1	0.042 (RPD=2.41)	1	0.025	1
0.003	0.011	BQL(0.005) (RPD=NA)	1	BQL(0.006)	1	BQL(0.008)	1	BQL(0.003)	1	BQL(0.007) (RPD=NA)	1	0.011	1
0.003	0.011	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
0.001	0.004	5.18 (RPD=0.00)	1	3.09	1	0.382	1	0.979	1	0.977 (RPD=0.20)	1	0.839	1
0.001	0.004	0.068 (RPD=14.97)	1	BQL(0.002)	1	BQL(0.003)	1	BQL(0.002)	1	ND (RPD=NA)	1	0.018	1
0.006	0.019	ND (RPD=NA)	1	ND	1	BQL(0.011)	1	ND	1	ND (RPD=NA)	1	BQL(0.016)	1
0.002	0.008	0.012 (RPD=8.70)	1	BQL(0.006)	1	BQL(0.002)	1	BQL(0.006)	1	BQL(0.007) (RPD=NA)	1	BQL(0.006)	1
0.007	0.022	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
0.049	0.163	9.85 (RPD=5.43)	1	5.28	1	13.5	1	11.4	1	11.4 (RPD=0.00)	1	16.3	1
0.102	0.341	ND (RPD=NA)	1	ND	1	3.24	1	ND	1	ND (RPD=NA)	1	ND	1
0.012	0.041	0.168 (RPD=6.34)	1	0.254	1	0.683	1	0.470	1	0.461 (RPD=1.93)	1	0.697	1
0.008	0.027	BQL(0.015) (RPD=NA)	1	BQL(0.011)	1	ND	1	ND	1	BQL(0.010) (RPD=NA)	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. " -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML 4-2		ML 4-2		ML 4-4		ML 4-4		ML 4-6		ML 5-2	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	BQL(0.099)	1	ND (RPD=NA)	1	ND	1	BQL(0.100) (RPD=NA)	1	BQL(0.108)	1	BQL(0.095)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.027	1	BQL(0.019) (RPD=NA)	1	0.021	1	BQL(0.018) (RPD=NA)	1	BQL(0.006)	1	ND	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	ND	1	BQL(0.019) (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.653	1	0.658 (RPD=0.76)	1	0.166	1	0.169 (RPD=1.52)	1	0.025	1	0.237	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.001) (RPD=NA)	1	0.008	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	126	1	126 (RPD=0.00)	1	51.1	1	51.3 (RPD=0.39)	1	30.8	1	61.4	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.018	1	0.018 (RPD=0.00)	1	ND	1	ND (RPD=NA)	1	0.004	1	0.015	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	0.005	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	BQL(0.016)	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	143	1	142 (RPD=0.70)	1	11.8	1	12.1 (RPD=2.51)	1	4.15	1	123	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	10.1	1	9.98 (RPD=1.20)	1	1.28	1	1.12 (RPD=13.33)	1	1.04	1	5.59	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	40.2	1	40.1 (RPD=0.25)	1	11.5	1	11.4 (RPD=0.87)	1	5.94	1	30.9	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.815	1	0.806 (RPD=1.11)	1	0.265	1	0.269 (RPD=1.50)	1	0.164	1	0.322	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1	0.010	1	ND	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	298	1	301 (RPD=1.00)	1	76.4	1	77.4 (RPD=1.30)	1	100	1	206	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	0.018	1	0.020 (RPD=10.53)	1	BQL(0.004)	1	BQL(0.004) (RPD=NA)	1	0.014	1	0.015	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.010)	1	0.011 (RPD=NA)	1	0.013	1	0.017 (RPD=26.67)	1	0.030	1	BQL(0.008)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	ND	1	ND (RPD=NA)	1	BQL(0.005)	1	0.019 (RPD=NA)	1	0.017	1	ND	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	1.80	1	1.82 (RPD=1.10)	1	0.692	1	0.699 (RPD=1.01)	1	0.285	1	0.482	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND (RPD=NA)	1	BQL(0.001)	1	BQL(0.001) (RPD=NA)	1	0.012	1	BQL(0.002)	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	0.026	1	0.025 (RPD=3.92)	1	0.021	1	BQL(0.014) (RPD=NA)	1	BQL(0.018)	1	BQL(0.011)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1	BQL(0.003) (RPD=NA)	1	BQL(0.005)	1	BQL(0.003) (RPD=NA)	1	BQL(0.007)	1	BQL(0.005)	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	ND (RPD=NA)	1	BQL(0.007)	1	BQL(0.009) (RPD=NA)	1	BQL(0.016)	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	7.28	1	7.12 (RPD=2.22)	1	11.6	1	11.8 (RPD=1.71)	1	14.7	1	6.71	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND	1	ND (RPD=NA)	1	5.08	1	5.23 (RPD=2.91)	1	9.70	1	ND	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.140	1	0.139 (RPD=0.72)	1	0.404	1	0.429 (RPD=6.00)	1	0.642	1	0.147	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

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Analytes		Unit	Field Sample ID		ML 5-4		ML 5-6		ML 5-6		DUPLICATE 2		ML 6-2		ML 6-4	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	0.176	1	12.3	1	12.3 (RPD=0.00)	1	BQL(0.111)	1	ND	1	0.251	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	BQL(0.006)	1	BQL(0.018)	1	0.026 (RPD=NA)	1	BQL(0.013)	1	BQL(0.018)	1	BQL(0.015)	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.055	1	0.080	1	0.082 (RPD=2.47)	1	0.055	1	0.125	1	0.078	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.004)	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	44.7	1	53.3	1	53.3 (RPD=0.00)	1	44.5	1	74.6	1	38.5	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1	ND	1	0.006	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	0.013	1	0.014 (RPD=7.41)	1	ND	1	BQL(0.002)	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.006)	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	8.00	1	30.0	1	30.0 (RPD=0.00)	1	7.99	1	36.4	1	6.97	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.29	1	2.23	1	2.08 (RPD=6.96)	1	1.08	1	6.59	1	1.89	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	15.2	1	11.2	1	11.3 (RPD=0.89)	1	15.2	1	30.3	1	7.26	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.113	1	0.345	1	0.345 (RPD=0.00)	1	0.113	1	0.453	1	0.186	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.004)	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1	BQL(0.003)	1	0.006	1	BQL(0.002)	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	101	1	124	1	123 (RPD=0.81)	1	99.8	1	173	1	116	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	0.009	1	0.011	1	0.011 (RPD=0.00)	1	BQL(0.004)	1	0.010	1	BQL(0.005)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	0.012	1	BQL(0.007)	1	0.012 (RPD=NA)	1	0.012	1	0.025	1	0.016	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.011)	1	ND	1	ND (RPD=NA)	1	BQL(0.008)	1	0.014	1	BQL(0.005)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.285	1	0.522	1	0.517 (RPD=0.96)	1	0.285	1	0.499	1	0.451	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.003)	1	0.321	1	0.324 (RPD=0.93)	1	BQL(0.002)	1	0.005	1	0.005	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	0.027	1	0.020	1	BQL(0.014) (RPD=NA)	1	BQL(0.012)	1	0.025	1	BQL(0.018)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.002)	1	0.023	1	0.024 (RPD=4.26)	1	BQL(0.004)	1	0.008	1	BQL(0.003)	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	BQL(0.016)	1	BQL(0.013) (RPD=NA)	1	BQL(0.009)	1	ND	1	BQL(0.007)	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	16.3	1	32.8	1	32.8 (RPD=0.00)	1	16.3	1	9.35	1	15.1	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND	1	2.27	1	2.23 (RPD=1.78)	1	ND	1	1.02	1	0.945	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.762	1	0.528	1	0.512 (RPD=3.08)	1	0.736	1	0.055	1	0.386	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

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Analytes		Unit	Field Sample ID		ML 6-6		ML 7-2		ML 7-2		ML 7-3		ML 7-4		ML 7-5	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	3.22	1	8.01	1	9.51 (RPD=17.12)	1	0.449	1	0.312	1	0.196	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	BQL(0.018)	1	BQL(0.015)	1	0.035 (RPD=NA)	1	0.048	1	ND	1	0.027	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.047	1	0.476	1	0.476 (RPD=0.00)	1	0.121	1	0.042	1	0.094	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	46.0	1	124	1	124 (RPD=0.00)	1	35.8	1	48.0	1	49.7	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.003)	1	0.050	1	0.049 (RPD=2.02)	1	0.008	1	BQL(0.002)	1	BQL(0.002)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	0.007	1	0.007 (RPD=0.00)	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	26.2	1	372	1	369 (RPD=0.81)	1	64.6	1	21.3	1	15.3	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	3.24	1	5.11	1	5.37 (RPD=4.96)	1	1.63	1	1.73	1	1.42	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	9.53	1	54.8	1	55.3 (RPD=0.91)	1	20.6	1	8.09	1	9.52	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.266	1	1.10	1	1.11 (RPD=0.90)	1	0.201	1	0.287	1	0.236	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.003)	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.002)	1	BQL(0.002)	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	105	1	226	1	223 (RPD=1.34)	1	315	1	103	1	97.4	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	0.009	1	0.042	1	0.040 (RPD=4.88)	1	BQL(0.007)	1	ND	1	BQL(0.006)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.007)	1	BQL(0.004)	1	BQL(0.006) (RPD=NA)	1	0.015	1	0.011	1	BQL(0.004)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.007)	1	ND	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.382	1	1.26	1	1.25 (RPD=0.80)	1	0.483	1	0.485	1	0.529	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.079	1	0.147	1	0.166 (RPD=12.14)	1	0.010	1	0.007	1	BQL(0.003)	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.017)	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.019)	1	0.023	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.005)	1	0.027	1	0.034 (RPD=22.95)	1	0.013	1	BQL(0.003)	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	20.9	1	26.6	1	28.4 (RPD=6.55)	1	11.4	1	18.0	1	18.5	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	1.42	1	ND	1	ND (RPD=NA)	1	3.70	1	0.478	1	ND	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.145	1	0.360	1	0.373 (RPD=3.55)	1	0.082	1	0.140	1	0.650	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. "- " denotes that the information is not available or the analyte is not analyzed.

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Field Sample ID		ML 7-6		ML 7-7		DUPLICATE 3							
Sample Lab ID		3712-15		3712-16		3712-17							
Date Collected		1/25/07		1/25/07		1/25/07							
Date Analyzed		2/11/07		2/11/07		2/11/07							
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.003	0.011	ND	1	ND	1	ND	1						
0.040	0.133	BQL(0.056)	1	ND	1	ND	1						
0.006	0.019	BQL(0.013)	1	BQL(0.009)	1	BQL(0.011)	1						
0.014	0.049	BQL(0.018)	1	BQL(0.021)	1	ND	1						
0.001	0.004	0.035	1	0.133	1	0.147	1						
0.001	0.004	ND	1	ND	1	ND	1						
0.027	0.089	51.3	1	44.1	1	44.4	1						
0.001	0.004	ND	1	ND	1	ND	1						
0.001	0.004	ND	1	ND	1	ND	1						
0.001	0.004	ND	1	ND	1	ND	1						
0.006	0.019	ND	1	ND	1	ND	1						
0.006	0.019	13.0	1	1.35	1	8.32	1						
0.061	0.204	1.64	1	1.82	1	1.63	1						
0.027	0.089	5.75	1	4.83	1	4.80	1						
0.001	0.004	0.277	1	0.286	1	0.288	1						
0.001	0.004	BQL(0.003)	1	BQL(0.002)	1	BQL(0.001)	1						
0.047	0.155	196	1	193	1	196	1						
0.003	0.011	ND	1	ND	1	ND	1						
0.002	0.008	BQL(0.005)	1	BQL(0.003)	1	BQL(0.003)	1						
0.003	0.011	BQL(0.007)	1	BQL(0.011)	1	BQL(0.006)	1						
0.003	0.011	BQL(0.006)	1	BQL(0.011)	1	0.014	1						
0.001	0.004	0.717	1	0.608	1	0.617	1						
0.001	0.004	ND	1	ND	1	ND	1						
0.006	0.019	0.026	1	0.021	1	0.021	1						
0.002	0.008	ND	1	ND	1	ND	1						
0.007	0.022	ND	1	ND	1	ND	1						
0.049	0.163	18.0	1	16.4	1	16.9	1						
0.102	0.341	BQL(0.145)	1	BQL(0.299)	1	0.508	1						
0.012	0.041	0.297	1	BQL(0.015)	1	0.107	1						
0.008	0.027	ND	1	ND	1	ND	1						

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. " -" denotes that the information is not available or the analyte is not analyzed.

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Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	FIELD BLANK	PMW-3	PMW-5	PMW-5	PMW-6	PMW-6
Sample Lab ID	3703-01	3703-02	3703-03	3703-03 Lab Dup.	3703-04	3703-04 Lab Dup.*
Date Collected	1/19/07	1/19/07	1/19/07	1/19/07	1/19/07	1/19/07
Date Analyzed	1/30 & 1/31/07	1/30 & 1/31/07	1/30 & 1/31/07	1/30 & 1/31/07	1/30 & 1/31/07	1/30 & 1/31/07

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	ND	5	33.8	5	3.17	5	3.22 (RPD=1.56)	5	3.83	5	3.62 (RPD=5.64)	5
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	ND	5	4.28	5	4.27	5	4.54 (RPD=6.13)	5	1.68	5	1.70 (RPD=1.18)	5
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	1.83	5	1.70	5	2.14	5	2.10 (RPD=1.89)	5	1.81	5	2.06 RPD=12.92)	5
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	ND	5	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	0.330	5	0.332	5	BQL(0.289)	5	BQL(0.230) (RPD=NA)	5	0.347	5	0.309 (RPD=11.59)	5
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	ND	5	10.3	5	35.4	5	38.0 (RPD=7.08)	5	10.1	5	9.06 (RPD=10.86)	5
Uranium (U)	7440-61-1	µg/L	0.002	0.008	ND	5	BQL(0.022)	5	BQL(0.022)	5	BQL(0.022) (RPD=NA)	5	BQL(0.026)	5	BQL(0.022) (RPD=NA)	5
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	2.02	5	9.49	5	6.17	5	6.44 (RPD=4.28)	5	4.94	5	4.69 (RPD=5.19)	5
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	5	ND	5	ND	5	ND (RPD=NA)	5	ND	5	ND (RPD=NA)	5

Comments:

Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 257(1)

Field Sample ID		PMW-1		DUPLICATE 1		ML 1-2		ML 1-2		ML 1-4		ML 1-6	
Sample Lab ID		3703-05		3703-06		3703-07		3703-07 Lab Dup.		3703-08		3703-09	
Date Collected		1/19/07		1/19/07		1/20/07		1/20/07		1/20/07		1/20/07	
Date Analyzed		1/30 & 1/31/07		1/30 & 1/31/07		1/30 & 1/31/07		1/30 & 1/31/07		1/30 & 1/31/07		1/30 & 1/31/07	
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.027	0.089	6.62	5	3.46	5	2.52	5	2.50 (RPD=0.80)	5	4.99	5	2.78	5
0.094	0.352	2.03	5	2.76	5	ND	5	ND (RPD=NA)	5	3.49	5	BQL(1.37)	5
0.034	0.115	1.71	5	1.26	5	2.03	5	2.03 (RPD=0.00)	5	2.26	5	2.30	5
0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
0.020	0.067	BQL(0.308)	5	BQL(0.157)	5	BQL(0.280)	5	BQL(0.266) (RPD=NA)	5	0.364	5	BQL(0.224)	5
0.203	0.677	5.93	5	8.73	5	9.58	5	9.19 (RPD=4.16)	5	10.1	5	7.71	5
0.002	0.008	0.179	5	BQL(0.020)	5	0.077	5	0.066 (RPD=15.38)	5	0.069	5	0.639	5
0.123	0.411	4.33	5	4.86	5	6.33	5	7.16 (RPD=12.31)	5	4.97	5	10.2	5
0.033	0.111	ND	5	ND	5	ND	5	ND (RPD=NA)	5	ND	5	ND	5

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 257(1)

Field Sample ID	ML 2-2	ML 2-3	ML 2-4	ML 2-5	ML 2-6	ML 2-6
Sample Lab ID	3703-10	3703-11	3703-12	3703-13	3703-14	3703-14 Lab Dup.
Date Collected	1/20/07	1/20/07	1/21/07	1/21/07	1/21/07	1/21/07
Date Analyzed	1/30 & 1/31/07	1/30 & 1/31/07	1/30 & 1/31/07	1/30 & 1/31/07	1/30 & 1/31/07	1/30 & 1/31/07

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	2.91	5	11.2	5	5.13	5	2.66	5	3.98	5	3.92 (RPD=1.52)	5
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	2.46	5	9.87	5	BQL(1.43)	5	7.36	5	3.24	5	3.38 (RPD=4.23)	5
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	2.24	5	3.64	5	1.78	5	2.57	5	2.64	5	2.59 (RPD=1.91)	5
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	0.354	5	BQL(0.296)	5	BQL(0.190)	5	1.08	5	1.50	5	1.49 (RPD=0.67)	5
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	11.0	5	10.0	5	12.1	5	5.34	5	10.8	5	11.1 (RPD=2.74)	5
Uranium (U)	7440-61-1	µg/L	0.002	0.008	0.055	5	0.067	5	0.285	5	0.533	5	1.70	5	1.68 (RPD=1.18)	5
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	8.95	5	6.88	5	6.29	5	5.10	5	8.24	5	8.43 (RPD=2.28)	5
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	5	ND	5	ND	5	ND	5	ND	5	ND (RPD=NA)	5

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 3-2	ML 3-2	ML 3-3	ML 3-4	ML 3-6	ML 3-7
Sample Lab ID	3703-15	3703-15 Lab Dup.*	3703-16	3703-17	3703-18	3703-19
Date Collected	1/21/07	1/21/07	1/21/07	1/21/07	1/21/07	1/22/07
Date Analyzed	1/30 & 1/31/07	1/30 & 1/31/07	1/30 & 1/31/07	1/30 & 1/31/07	1/30 & 1/31/07	1/30 & 1/31/07

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	6.83	5	6.80 (RPD=0.44)	5	10.9	5	1.95	5	0.825	5	1.13	5
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	21.4	5	20.4 (RPD=4.78)	5	10.5	5	2.96	5	8.07	5	6.26	5
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	4.32	5	4.13 (RPD=4.50)	5	3.21	5	1.84	5	1.73	5	2.20	5
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	1.42	5	1.32 (RPD=7.30)	5	0.335	5	BQL(0.258)	5	BQL(0.298)	5	0.431	5
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	42.6	5	44.4 (RPD=4.14)	5	20.1	5	24.1	5	28.9	5	18.6	5
Uranium (U)	7440-61-1	µg/L	0.002	0.008	0.144	5	0.136 (RPD=5.71)	5	BQL(0.014)	5	BQL(0.025)	5	BQL(0.022)	5	0.104	5
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	16.6	5	13.1 (RPD=23.57)	5	9.55	5	5.62	5	8.67	5	7.33	5
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	5	ND (RPD=NA)	5	ND	5	ND	5	ND	5	ND	5

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 257(1)

Field Sample ID		ML 4-2		ML 4-2		ML 4-4		ML 4-4		ML 4-6		ML 5-2	
Sample Lab ID		3712-01		3712-01 Lab Dup.		3712-02		3712-02 Lab Dup.*		3712-03		3712-04	
Date Collected		1/22/07		1/22/07		1/23/07		1/23/07		1/23/07		1/23/07	
Date Analyzed		2/6, 2/8 & 2/9/07		2/6, 2/8 & 2/9/07		2/6, 2/8 & 2/9/07		2/6, 2/8 & 2/9/07		2/6, 2/8 & 2/9/07		2/6, 2/8 & 2/9/07	
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.027	0.089	7.30	5	7.18 (RPD=1.66)	5	14.2	5	14.9 (RPD=4.81)	5	2.43	5	8.29	5
0.094	0.352	7.62	5	7.28 (RPD=4.56)	5	2.14	5	2.31 (RPD=7.64)	5	2.09	5	4.87	5
0.034	0.115	1.35	5	1.32 (RPD=2.25)	5	0.732	5	0.957 (RPD=26.64)	5	0.579	5	0.840	5
0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
0.020	0.067	BQL(0.216)	5	BQL(0.211) (RPD=NA)	5	BQL(0.195)	5	BQL(0.249) (RPD=NA)	5	BQL(0.180)	5	BQL(0.186)	5
0.203	0.677	20.7	5	22.2 (RPD=6.99)	5	8.60	5	9.65 (RPD=11.51)	5	9.45	5	10.4	5
0.002	0.008	BQL(0.030)	5	BQL(0.028) (RPD=NA)	5	0.041	5	0.043 (RPD=4.76)	5	BQL(0.021)	5	BQL(0.019)	5
0.123	0.411	8.50	5	8.70 (RPD=2.33)	5	3.34	5	6.80 (RPD=68.24)	5	3.58	5	3.10	5
0.033	0.111	ND	5	ND (RPD=NA)	5	ND	5	ND (RPD=NA)	5	ND	5	ND	5

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: **3ME382HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 5-4	ML 5-6	DUPLICATE 2	ML 6-2	ML 6-4	ML 6-4
Sample Lab ID	3712-05	3712-06	3712-07	3712-08	3712-09	3712-09 Lab Dup.
Date Collected	1/23/07	1/23/07	1/23/07	1/23/07	1/24/07	1/24/07
Date Analyzed	2/6, 2/8 & 2/9/07	2/6, 2/8 & 2/9/07	2/6, 2/8 & 2/9/07	2/6, 2/8 & 2/9/07	2/6, 2/8 & 2/9/07	2/6, 2/8 & 2/9/07

Analytes		Unit	MDL	QL	Data		DF	Data		DF	Data		DF	Data		DF	Data		DF
Names	Codes																		
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	1.90		5	4.54		5	1.94		5	3.22		5	1.13		5
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	4.24		5	20.0		5	4.53		5	4.17		5	2.58		5
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	1.07		5	4.44		5	0.612		5	0.814		5	0.780		5
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—		—	—		—	—		—	—		—	—		—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	BQL(0.247)		5	4.84		5	BQL(0.139)		5	BQL(0.165)		5	BQL(0.194)		5
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	11.2		5	10.1		5	11.0		5	9.40		5	13.2		5
Uranium (U)	7440-61-1	µg/L	0.002	0.008	BQL(0.020)		5	1.27		5	BQL(0.019)		5	ND		5	0.118		5
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	3.40		5	16.2		5	2.42		5	BQL(1.17)		5	BQL(1.53)		5
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND		5	ND		5	ND		5	ND		5	ND		5

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Laboratory: **Metals** Report Date: **2/19/07**

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Technical Directive: **3ME382HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 6-6	ML 7-2	ML 7-2	ML 7-3	ML 7-4	ML 7-5
Sample Lab ID	3712-10	3712-11	3712-11 Lab Dup.*	3712-12	3712-13	3712-14
Date Collected	1/24/07	1/24/07	1/24/07	1/24/07	1/24/07	1/25/07
Date Analyzed	2/6, 2/8 & 2/9/07	2/6, 2/8 & 2/9/07	2/6, 2/8 & 2/9/07	2/6, 2/8 & 2/9/07	2/6, 2/8 & 2/9/07	2/6, 2/8 & 2/9/07

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	3.93	5	8.10	5	8.50 (RPD=4.82)	5	47.3	5	0.915	5	0.958	5
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	6.14	5	24.9	5	27.8 (RPD=11.01)	5	4.99	5	2.36	5	4.51	5
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	2.03	5	4.11	5	4.24 (RPD=3.11)	5	0.647	5	0.652	5	0.882	5
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	1.39	5	3.89	5	4.37 (RPD=11.62)	5	BQL(0.290)	5	BQL(0.256)	5	BQL(0.201)	5
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	9.70	5	12.1	5	11.6 (RPD=4.22)	5	11.4	5	12.4	5	17.2	5
Uranium (U)	7440-61-1	µg/L	0.002	0.008	0.258	5	0.901	5	0.964 (RPD=6.76)	5	0.101	5	BQL(0.026)	5	BQL(0.024)	5
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	5.60	5	15.8	5	16.9 (RPD=6.73)	5	ND	5	5.25	5	BQL(1.88)	5
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	5	ND	5	ND (RPD=NA)	5	ND	5	ND	5	ND	5

Comments:

Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 7-6	ML 7-7	DUPLICATE 3			
Sample Lab ID	3712-15	3712-16	3712-17			
Date Collected	1/25/07	1/25/07	1/25/07			
Date Analyzed	2/6, 2/8 & 2/9/07	2/6, 2/8 & 2/9/07	2/6, 2/8 & 2/9/07			

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	0.956	5	0.950	5	1.38	5						
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	2.37	5	1.85	5	1.79	5						
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	BQL(0.252)	5	BQL(0.298)	5	BQL(0.278)	5						
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—						
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	BQL(0.114)	5	BQL(0.114)	5	BQL(0.146)	5						
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	14.0	5	12.0	5	13.2	5						
Uranium (U)	7440-61-1	µg/L	0.002	0.008	0.048	5	ND	5	BQL(0.012)	5						
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	ND	5	ND	5	ND	5						
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	5	ND	5	ND	5						

Comments:
Some elements had duplicate RPD values above 20% for the digested duplicates. Notified the originator and we both agreed that without access to a clean room low RPD's would be difficult to obtain on low level digested samples. He requested the data be reported and a comment be added to the report. Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1). * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: **3ME383HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Field Sample ID	FIELD BLANK	PMW-3	PMW-5	PMW-6	PMW-6	PMW-1
Sample Lab ID	3704-01	3704-02	3704-03	3704-04	3704-04 Lab Dup.	3704-05
Date Collected	1/19/07	1/19/07	1/19/07	1/19/07	1/19/07	1/19/07
Date Analyzed	1/24, 1/25 & 1/30/07	1/24 & 1/25/07	1/24 & 1/25/07	1/24 & 1/25/07	1/24 & 1/25/07	1/24 & 1/25/07

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	BQL(0.035)	1	56.2	1	4.15	1	5.03	1	4.84 (RPD=3.85)	1	9.23	1
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	BQL(0.199)	1	0.537	1	0.536	1	0.407	1	0.401 (RPD=1.49)	1	0.580	1
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	BQL(0.070)	1	0.358	1	0.535	1	0.526	1	0.462 (RPD=12.96)	1	0.716	1
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	ND	1	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	BQL(0.018)	1	ND	1	ND (RPD=NA)	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	ND	1	8.84	1	7.74	1	6.02	1	5.94 (RPD=1.34)	1	4.18	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND	1	0.022	1	0.014	1	0.015	1	0.015 (RPD=0.00)	1	0.095	1
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	0.409	1	1.79	1	2.21	1	0.656	1	0.615 (RPD=6.45)	1	1.79	1
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1	BQL(0.039)	1	ND	1	BQL(0.064)	1	BQL(0.062) (RPD=NA)	1	BQL(0.042)	1

Comments:
Chromium and selenium were analyzed by the Collision Cell Technology (CCT) to help reduce interferences caused by polyatomic species. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts:	Steve Markham		Field Sample ID		Duplicate 1		ML 1-2		ML 1-4		ML 1-6		ML 2-2		ML 2-3		
	Method:	RSKSOP 257(1)	Sample Lab ID		3704-06		3704-07		3704-08		3704-09		3704-10		3704-11		
			Date Collected		1/19/07		1/20/07		1/20/07		1/20/07		1/20/07		1/20/07		
			Date Analyzed		1/24 & 1/25/07		1/24 & 1/25/07		1/24 & 1/25/07		1/24 & 1/25/07		1/24 & 1/25/07		1/24 & 1/25/07		
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																
Arsenic (As)		7440-38-2	µg/L	0.024	0.080	5.26	1	3.85	1	8.52	1	4.68	1	7.46	1	21.6	1
Chromium (Cr)		7440-47-3	µg/L	0.085	0.317	0.391	1	BQL(0.182)	1	BQL(0.250)	1	BQL(0.149)	1	0.322	1	0.399	1
Copper (Cu)		7440-50-8	µg/L	0.031	0.104	0.450	1	0.797	1	0.486	1	0.608	1	0.793	1	2.63	1
Iron (Fe)		7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)		7439-92-1	µg/L	0.018	0.060	ND	1	0.160	1	BQL(0.044)	1	ND	1	ND	1	ND	1
Selenium (Se)		7782-49-2	µg/L	0.183	0.610	6.02	1	6.65	1	7.93	1	5.63	1	7.28	1	6.45	1
Uranium (U)		7440-61-1	µg/L	0.002	0.007	0.016	1	0.050	1	0.054	1	0.739	1	0.014	1	ND	1
Zinc (Zn)		7440-62-2	µg/L	0.111	0.370	0.921	1	1.19	1	3.87	1	7.28	1	1.72	1	3.56	1
Mercury (Hg)		7439-97-6	µg/L	0.030	0.100	BQL(0.051)	1	ND	1	BQL(0.051)	1	BQL(0.056)	1	BQL(0.047)	1	ND	1

Comments:
Chromium and selenium were analyzed by the Collision Cell Technology (CCT) to help reduce interferences caused by polyatomic species. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: **3ME383HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Analytes		Unit	MDL		Data	DF	Data		Data	DF	Data		Data	DF	Data		Data	DF
Names	Codes																	
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	11.6	1	12.0 (RPD=3.39)	1	4.34	1	5.28	1	8.19	1	16.1	1		
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	0.482	1	0.468 (RPD=2.95)	1	0.329	1	BQL(0.215)	1	BQL(0.194)	1	ND	1		
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	0.378	1	0.365 (RPD=3.50)	1	0.424	1	0.286	1	2.71	1	2.34	1		
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—		
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	BQL(0.052)	1	BQL(0.045) (RPD=NA)	1	BQL(0.044)	1	ND	1	BQL(0.046)	1	ND	1		
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	8.55	1	8.34 (RPD=2.49)	1	6.84	1	6.56	1	32.4	1	11.8	1		
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.185	1	0.185 (RPD=0.00)	1	0.299	1	1.30	1	ND	1	ND	1		
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	0.590	1	0.594 (RPD=0.68)	1	0.938	1	1.81	1	5.01	1	3.66	1		
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1		

Comments:
Chromium and selenium were analyzed by the Collision Cell Technology (CCT) to help reduce interferences caused by polyatomic species. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts:

Steve Markham

Method:

RSKSOP 257(1)

Analysts:	Steve Markham		Field Sample ID		ML 3-4		ML 3-6		ML 3-7		ML 4-2		ML 4-4		ML 4-6		
	RSKSOP 257(1)				Sample Lab ID		3704-17		3704-18		3704-19		3713-01		3713-02		3713-03
Method:			Date Collected		1/21/07		1/21/07		1/22/07		1/22/07		1/23/07		1/23/07		
			Date Analyzed		1/24 & 1/25/07		1/24 & 1/25/07		1/24 & 1/25/07		1/29, 2/1 & 2/5/07		1/29, 2/1 & 2/5/07		1/29, 2/1 & 2/5/07		
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes																
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	3.38	1	1.57	1	1.71	1	8.02	1	22.2	1	4.37	1	
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	BQL(0.302)	1	ND	1	ND	1	BQL(0.315)	1	BQL(0.199)	1	BQL(0.209)	1	
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	0.314	1	0.868	1	0.725	1	1.05	1	0.374	1	0.154	1	
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—	
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	11.0	1	15.9	1	10.8	1	10.9	1	8.28	1	6.80	1	
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND	1	ND	1	ND	1	0.033	1	0.034	1	0.019	1	
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	0.487	1	2.32	1	1.03	1	2.86	1	1.64	1	1.13	1	
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1	ND	1	ND	1	BQL(0.066)	1	ND	1	ND	1	

Comments:
Chromium and selenium were analyzed by the Collision Cell Technology (CCT) to help reduce interferences caused by polyatomic species. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP:257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Analysts:	Steve Markham		Field Sample ID Sample Lab ID Date Collected Date Analyzed		ML 4-6		ML 5-2		ML 5-4		ML 5-6		Duplicate 2		ML 6-2		
					3713-03 Lab Dup.		3713-04		3713-05		3713-06		3713-07		3713-08		
					1/23/07		1/23/07		1/23/07		1/23/07		1/23/07		1/23/07		
					1/29, 2/1 & 2/5/07		1/29, 2/1 & 2/5/07		1/29, 2/1 & 2/5/07		1/29, 2/1 & 2/5/07		1/29, 2/1 & 2/5/07		1/29, 2/1 & 2/5/07		
Method:	RSKSP 257(1)		Unit		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Analytes																	
Names		Codes															
Arsenic (As)		7440-38-2	µg/L	0.024	0.080	4.40 (RPD=0.68)	1	8.67	1	2.83	1	1.82	1	2.88	1	4.66	1
Chromium (Cr)		7440-47-3	µg/L	0.085	0.317	BQL(0.236) (RPD=NA)	1	0.364	1	0.449	1	0.353	1	0.412	1	BQL(0.170)	1
Copper (Cu)		7440-50-8	µg/L	0.031	0.104	0.146 (RPD=5.33)	1	0.520	1	0.263	1	0.501	1	0.281	1	0.591	1
Iron (Fe)		7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)		7439-92-1	µg/L	0.018	0.060	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Selenium (Se)		7782-49-2	µg/L	0.183	0.610	6.94 (RPD=2.04)	1	8.70	1	8.52	1	8.33	1	8.56	1	9.17	1
Uranium (U)		7440-61-1	µg/L	0.002	0.007	0.019 (RPD=0.00)	1	0.012	1	BQL(0.006)	1	ND	1	0.007	1	0.010	1
Zinc (Zn)		7440-62-2	µg/L	0.111	0.370	1.23 (RPD=8.47)	1	1.39	1	0.527	1	3.34	1	0.537	1	10.0	1
Mercury (Hg)		7439-97-6	µg/L	0.030	0.100	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:
 Chromium and selenium were analyzed by the Collision Cell Technology (CCT) to help reduce interferences caused by polyatomic species. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Laboratory: **Metals** Report Date: **2/19/07**

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Technical Directive: **3ME383HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Analytes		Unit	MDL	QL	ML 6-4		ML 6-6		ML 7-2		ML 7-3		ML 7-4		ML 7-4	
Names	Codes				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	1.98	1	3.30	1	5.13	1	45.3	10	1.90	1	1.90 (RPD=0.00)	1
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	BQL(0.314)	1	BQL(0.221)	1	1.47	1	BQL(0.253)	1	0.343	1	0.357 (RPD=4.00)	1
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	0.180	1	0.214	1	1.02	1	0.297	1	0.194	1	0.193 (RPD=0.52)	1
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND	1	BQL(0.019)	1	ND	1	ND (RPD=NA)	1
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	8.47	1	7.98	1	11.3	1	10.5	1	7.79	1	7.86 (RPD=0.89)	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.074	1	BQL(0.005)	1	0.080	1	0.080	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	0.394	1	0.536	1	5.97	1	1.44	1	BQL(0.306)	1	BQL(0.290) (RPD=NA)	1
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1	ND	1	BQL(0.031)	1	ND	1	ND	1	ND (RPD=NA)	1

Comments:

Chromium and selenium were analyzed by the Collision Cell Technology (CCT) to help reduce interferences caused by polyatomic species. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 2/19/07

Technical Directive: 3ME383HW

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(1)

Analysts:	Steve Markham		Field Sample ID		ML 7-5		ML 7-6		ML 7-7		Duplicate 3					
	RSKSOP 257(1)		Sample Lab ID		3713-14		3713-15		3713-16		3713-17					
Method:			Date Collected		1/25/07		1/25/07		1/25/07		1/25/07					
			Date Analyzed		1/29, 2/1 & 2/5/07		1/29, 2/1 & 2/5/07		1/29, 2/1 & 2/5/07		1/29, 2/1 & 2/5/07					
Analytes				Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names		Codes														
Arsenic (As)		7440-38-2	µg/L	0.024	0.080	1.75	1	1.75	1	2.29	1	2.36	1			
Chromium (Cr)		7440-47-3	µg/L	0.085	0.317	0.376	1	BQL(0.258)	1	BQL(0.196)	1	BQL(0.168)	1			
Copper (Cu)		7440-50-8	µg/L	0.031	0.104	0.259	1	0.191	1	0.197	1	0.187	1			
Iron (Fe)		7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—			
Lead (Pb)		7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND	1	ND	1			
Selenium (Se)		7782-49-2	µg/L	0.183	0.610	7.60	1	7.51	1	7.38	1	7.24	1			
Uranium (U)		7440-61-1	µg/L	0.002	0.007	0.020	1	0.039	1	0.009	1	0.010	1			
Zinc (Zn)		7440-62-2	µg/L	0.111	0.370	2.07	1	0.412	1	BQL(0.158)	1	BQL(0.253)	1			
Mercury (Hg)		7439-97-6	µg/L	0.030	0.100	ND	1	ND	1	ND	1	ND	1			

Comments:
Chromium and selenium were analyzed by the Collision Cell Technology (CCT) to help reduce interferences caused by polyatomic species. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP:257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive:3ME383HW

Sample Results (1, 2)

Analysts:	S. Markham/S. Saye		Field Sample ID		FIELD BLANK		PMW-3		PMW-3		PMW-5		PMW-6		PMW-1			
			Sample Lab ID		3704-01		3704-02		3704-02 Lab Dup.		3704-03		3704-04		3704-05			
			Date Collected		1/19/07		1/19/07		1/19/07		1/19/07		1/19/07		1/19/07			
			Date Analyzed		1/24/07		1/24/07		1/24/07		1/24/07		1/24/07		1/24/07			
Method:	RSKSOP 213(2)		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
																		Names
Analytes																		
Silver (Ag)			7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Aluminum (Al)			7429-90-5	mg/L	0.036	0.120	ND	1	BQL(0.038)	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Arsenic (As)			7440-38-2	mg/L	0.005	0.017	ND	1	0.067	1	0.067 (RPD=0.00)	1	0.018	1	0.025	1	0.028	1
Boron (B)			7440-42-8	mg/L	0.013	0.044	ND	1	0.290	1	0.291 (RPD=0.34)	1	0.403	1	0.192	1	0.337	1
Barium (Ba)			7440-39-3	mg/L	0.001	0.004	ND	1	0.058	1	0.059 (RPD=1.71)	1	0.084	1	0.037	1	0.102	1
Beryllium (Be)			7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Calcium (Ca)			7440-70-2	mg/L	0.024	0.080	ND	1	33.9	1	34.0 (RPD=0.29)	1	54.8	1	48.4	1	64.3	1
Cadmium (Cd)			7440-43-9	mg/L	0.001	0.004	ND	1	0.004	1	BQL(0.004) (RPD=NA)	1	0.011	1	BQL(0.003)	1	0.013	1
Cobalt (Co)			7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	BQL(0.002)	1	ND	1	BQL(0.001)	1
Chromium (Cr)			7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Copper (Cu)			7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Iron (Fe)			7439-89-6	mg/L	0.005	0.017	ND	1	26.7	1	26.8 (RPD=0.37)	1	72.0	1	17.9	1	87.9	1
Potassium (K)			7440-09-7	mg/L	0.055	0.184	ND	1	2.47	1	2.47 (RPD=0.00)	1	3.53	1	3.38	1	2.92	1
Magnesium (Mg)			7439-95-4	mg/L	0.024	0.080	ND	1	12.1	1	12.3 (RPD=1.64)	1	13.5	1	6.55	1	8.83	1
Manganese (Mn)			7439-96-5	mg/L	0.001	0.004	ND	1	0.154	1	0.155 (RPD=0.65)	1	0.268	1	0.198	1	0.345	1
Molybdenum (Mo)			7439-98-7	mg/L	0.001	0.004	ND	1	BQL(0.002)	1	BQL(0.002) (RPD=NA)	1	ND	1	BQL(0.003)	1	ND	1
Sodium (Na)			7440-23-5	mg/L	0.042	0.140	BQL(0.092)	1	76.1	1	77.0 (RPD=1.18)	1	61.7	1	61.3	1	38.6	1
Nickel (Ni)			7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Lead (Pb)			7439-92-1	mg/L	0.002	0.007	ND	1	BQL(0.003)	1	ND (RPD=NA)	1	0.009	1	ND	1	0.009	1
Antimony (Sb)			7440-36-0	mg/L	0.003	0.010	ND	1	BQL(0.006)	1	BQL(0.007) (RPD=NA)	1	BQL(0.009)	1	BQL(0.009)	1	BQL(0.006)	1
Selenium (Se)			7782-49-2	mg/L	0.003	0.010	ND	1	0.018	1	0.017 (RPD=5.71)	1	ND	1	0.019	1	ND	1
Strontium (Sr)			7440-24-6	mg/L	0.001	0.004	ND	1	0.188	1	0.191 (RPD=1.58)	1	0.275	1	0.201	1	0.266	1
Titanium (Ti)			7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Thallium (Tl)			7440-28-0	mg/L	0.005	0.017	ND	1	BQL(0.010)	1	BQL(0.012) (RPD=NA)	1	BQL(0.012)	1	BQL(0.015)	1	BQL(0.011)	1
Vanadium (V)			7440-62-2	mg/L	0.002	0.007	ND	1	BQL(0.003)	1	ND (RPD=NA)	1	ND	1	ND	1	BQL(0.003)	1
Zinc (Zn)			7440-66-6	mg/L	0.006	0.020	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.008)	1	ND	1
Sillicon (Si)			7440-21-3	mg/L	0.044	0.147	BQL(0.074)	1	17.1	1	17.2 (RPD=0.58)	1	22.6	1	14.3	1	5.80	1
Sulfur (S)			7704-34-9	mg/L	0.092	0.307	ND	1	53.7	1	54.6 (RPD=1.66)	1	11.1	1	9.49	1	3.27	1
Phosphorus (P)			7723-14-0	mg/L	0.011	0.037	BQL(0.026)	1	1.35	1	1.35 (RPD=0.00)	1	1.12	1	1.07	1	0.207	1
Uranium (U)			7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

- Notes:
- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
 - "-" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

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Technical Directive:

3ME383HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		DUPLICATE 1		ML 1-2		ML 1-4		ML 1-6		ML 2-2		ML 2-2	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.019	1	0.040	1	0.020	1	BQL(0.011)	1	0.022	1	0.020 (RPD=9.52)	1
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.193	1	0.290	1	0.217	1	0.182	1	0.617	1	0.617 (RPD=0.00)	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.035	1	0.214	1	0.046	1	0.033	1	0.199	1	0.198 (RPD=0.50)	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	46.1	1	95.0	1	38.6	1	28.4	1	74.8	1	73.9 (RPD=1.21)	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.003)	1	0.009	1	BQL(0.001)	1	ND	1	0.024	1	0.024 (RPD=0.00)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	17.3	1	59.7	1	8.91	1	0.148	1	160	1	158 (RPD=1.26)	1
Potassium (K)	7440-09-7	mg/L	0.055	0.184	3.25	1	4.90	1	1.73	1	1.43	1	1.41	1	1.39 (RPD=1.43)	1
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	6.25	1	17.0	1	8.42	1	5.96	1	39.2	1	38.6 (RPD=1.54)	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.189	1	0.738	1	0.197	1	0.095	1	0.636	1	0.634 (RPD=0.31)	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.001)	1	BQL(0.002)	1	0.007	1	ND	1	ND (RPD=NA)	1
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	59.9	1	161	1	185	1	142	1	78.7	1	77.8 (RPD=1.15)	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	BQL(0.006)	1	ND	1	ND	1	0.016	1	0.014 (RPD=13.33)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.007)	1	0.010	1	BQL(0.006)	1	BQL(0.006)	1	BQL(0.005)	1	BQL(0.007) (RPD=NA)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	0.023	1	0.023	1	0.020	1	0.018	1	ND	1	ND (RPD=NA)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.189	1	0.472	1	0.482	1	0.143	1	0.490	1	0.487 (RPD=0.61)	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.015)	1	0.025	1	BQL(0.016)	1	BQL(0.016)	1	ND	1	ND (RPD=NA)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	ND	1	ND	1	BQL(0.002)	1	0.020	1	BQL(0.005)	1	ND (RPD=NA)	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	BQL(0.008)	1	ND	1	BQL(0.009)	1	BQL(0.014)	1	ND	1	ND (RPD=NA)	1
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	14.4	1	6.13	1	12.5	1	17.0	1	10.5	1	10.4 (RPD=0.96)	1
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	9.86	1	88.2	1	33.3	1	35.6	1	0.514	1	0.615 (RPD=17.89)	1
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	1.12	1	0.047	1	0.627	1	0.083	1	0.061	1	0.060 (RPD=1.65)	1
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. * -* denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analysts:	S. Markham/S. Saye	Field Sample ID			ML 2-3		ML 2-4		ML 2-5		ML 2-6		ML 3-2		ML 3-3			
		Sample Lab ID			3704-11		3704-12		3704-13		3704-14		3704-15		3704-16			
		Date Collected			1/20/07		1/21/07		1/21/07		1/21/07		1/21/07		1/21/07			
		Date Analyzed			1/24/07		1/24/07		1/24/07		1/24/07		1/24/07		1/24/07			
Method:	RSKSOP 213(2)	Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF		
																	Analytes	
																	Names	Codes
		mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
		mg/L	0.036	0.120	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
		mg/L	0.005	0.017	0.025	1	0.034	1	0.026	1	0.021	1	0.018	1	0.021	1		
		mg/L	0.013	0.044	0.967	1	0.257	1	0.170	1	0.175	1	1.44	1	1.20	1		
		mg/L	0.001	0.004	1.11	1	0.064	1	0.022	1	0.019	1	1.72	1	0.465	1		
		mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	BQL(0.001)	1	ND	1		
		mg/L	0.024	0.080	271	1	43.8	1	24.2	1	23.4	1	241	1	200	1		
		mg/L	0.001	0.004	0.041	1	BQL(0.002)	1	ND	1	ND	1	0.067	1	0.059	1		
		mg/L	0.001	0.004	0.005	1	ND	1	ND	1	ND	1	0.008	1	0.007	1		
		mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
		mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
		mg/L	0.005	0.017	268	1	12.6	1	1.95	1	0.670	1	419	1	366	1		
		mg/L	0.055	0.184	4.23	1	1.50	1	0.984	1	1.24	1	205	1	7.15	1		
		mg/L	0.024	0.080	80.7	1	10.9	1	3.37	1	4.23	1	82.1	1	95.8	1		
		mg/L	0.001	0.004	1.64	1	0.195	1	0.099	1	0.091	1	1.28	1	1.08	1		
		mg/L	0.001	0.004	ND	1	BQL(0.004)	1	BQL(0.003)	1	0.006	1	ND	1	ND	1		
		mg/L	0.042	0.140	408	1	166	1	66.3	1	107	1	670	1	247	1		
		mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
		mg/L	0.002	0.007	0.028	1	ND	1	ND	1	ND	1	0.045	1	0.040	1		
		mg/L	0.003	0.010	BQL(0.006)	1	BQL(0.009)	1	BQL(0.007)	1	BQL(0.008)	1	ND	1	BQL(0.006)	1		
		mg/L	0.003	0.010	ND	1	0.032	1	0.024	1	0.029	1	ND	1	ND	1		
		mg/L	0.001	0.004	3.51	1	0.436	1	0.246	1	0.170	1	5.06	1	3.00	1		
		mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
		mg/L	0.005	0.017	ND	1	0.018	1	BQL(0.010)	1	BQL(0.009)	1	ND	1	ND	1		
		mg/L	0.002	0.007	ND	1	ND	1	ND	1	0.014	1	ND	1	BQL(0.004)	1		
		mg/L	0.006	0.020	ND	1	BQL(0.009)	1	BQL(0.007)	1	BQL(0.009)	1	ND	1	ND	1		
		mg/L	0.044	0.147	11.2	1	17.3	1	15.6	1	16.4	1	5.71	1	5.36	1		
		mg/L	0.092	0.307	BQL(0.287)	1	8.23	1	11.9	1	16.9	1	ND	1	ND	1		
		mg/L	0.011	0.037	0.280	1	0.446	1	1.67	1	0.585	1	0.063	1	0.179	1		
		mg/L	0.007	0.024	BQL(0.014)	1	ND	1	ND	1	ND	1	BQL(0.018)	1	BQL(0.012)	1		

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. " - " denotes that the information is not available or the analyte is not analyzed.

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Analytical Service Results Report

Laboratory:

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Technical Directive:

3ME383HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	MDL	QL	Field Sample ID		ML 3-4		ML 3-6		ML 3-7		ML 4-2		ML 4-4		ML 4-6	
Names	Codes				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	BQL(0.056)	1	ND	1	BQL(0.039)	1	ND	1	BQL(0.036)	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	BQL(0.017)	1	BQL(0.013)	1	0.030	1	0.032	1	0.053	1	0.026	1	0.026	1
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.321	1	1.10	1	0.526	1	0.782	1	0.211	1	0.184	1	0.184	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.066	1	0.134	1	0.177	1	0.623	1	0.171	1	0.031	1	0.031	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	43.6	1	115	1	104	1	124	1	50.7	1	30.8	1	30.8	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.009	1	0.049	1	0.020	1	0.024	1	BQL(0.003)	1	BQL(0.001)	1	BQL(0.001)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	BQL(0.001)	1	0.007	1	0.004	1	BQL(0.002)	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	60.2	1	317	1	135	1	154	1	17.0	1	6.41	1	6.41	1
Potassium (K)	7440-09-7	mg/L	0.055	0.184	7.29	1	2.66	1	2.13	1	10.7	1	1.22	1	1.22	1	1.22	1
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	10.7	1	25.4	1	16.3	1	39.5	1	11.5	1	5.78	1	5.78	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.227	1	1.08	1	0.810	1	0.787	1	0.263	1	0.159	1	0.159	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	BQL(0.003)	1	BQL(0.003)	1	BQL(0.003)	1
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	68.9	1	117	1	121	1	284	1	66.3	1	81.4	1	81.4	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	0.008	1	0.036	1	0.015	1	0.015	1	BQL(0.005)	1	ND	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.006)	1	BQL(0.008)	1	BQL(0.005)	1	BQL(0.005)	1	BQL(0.005)	1	BQL(0.007)	1	BQL(0.007)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	0.023	1	0.018	1	0.018	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.400	1	0.967	1	0.847	1	1.79	1	0.715	1	0.286	1	0.286	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.002)	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.008)	1	ND	1	BQL(0.012)	1	BQL(0.013)	1	0.020	1	BQL(0.016)	1	BQL(0.016)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	ND	1	BQL(0.003)	1	ND	1	BQL(0.003)	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	BQL(0.008)	1	BQL(0.007)	1	BQL(0.007)	1
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	14.1	1	11.8	1	15.4	1	8.27	1	13.4	1	16.1	1	16.1	1
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	4.58	1	ND	1	ND	1	BQL(0.279)	1	6.20	1	10.7	1	10.7	1
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	1.32	1	0.526	1	0.753	1	0.081	1	0.765	1	1.21	1	1.21	1
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
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Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

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Technical Directive:

3ME383HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	MDL	QL	ML 5-2		ML 5-4		ML 5-6		ML 5-6		DUPLICATE 2		ML 6-2	
Names	Codes				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.039	1	0.027	1	0.020	1	0.020 (RPD=0.00)	1	0.023	1	0.026	1
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.563	1	0.205	1	0.251	1	0.251 (RPD=0.00)	1	0.202	1	0.447	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.219	1	0.053	1	0.048	1	0.048 (RPD=0.00)	1	0.052	1	0.148	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	59.6	1	43.8	1	48.9	1	48.9 (RPD=0.00)	1	43.5	1	74.0	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.019	1	BQL(0.001)	1	BQL(0.004)	1	BQL(0.003) (RPD=NA)	1	BQL(0.001)	1	0.015	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	BQL(0.002)	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.002)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	130	1	7.80	1	22.6	1	22.6 (RPD=0.00)	1	7.66	1	105	1
Potassium (K)	7440-09-7	mg/L	0.055	0.184	5.38	1	1.18	1	1.43	1	1.45 (RPD=1.39)	1	1.17	1	6.73	1
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	30.6	1	14.8	1	9.95	1	9.85 (RPD=1.01)	1	14.7	1	30.0	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.312	1	0.113	1	0.298	1	0.296 (RPD=0.67)	1	0.110	1	0.439	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	BQL(0.003)	1	BQL(0.001)	1	BQL(0.001) (RPD=NA)	1	BQL(0.003)	1	ND	1
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	188	1	83.4	1	119	1	119 (RPD=0.00)	1	83.1	1	162	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	0.014	1	ND	1	ND	1	BQL(0.003) (RPD=NA)	1	ND	1	0.014	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.007)	1	BQL(0.007)	1	BQL(0.004)	1	BQL(0.007) (RPD=NA)	1	BQL(0.005)	1	BQL(0.009)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	ND	1	0.020	1	BQL(0.010)	1	BQL(0.004) (RPD=NA)	1	0.015	1	ND	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.466	1	0.292	1	0.494	1	0.490 (RPD=0.81)	1	0.292	1	0.499	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1	0.020	1	0.020	1	BQL(0.016) (RPD=NA)	1	0.018	1	BQL(0.008)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	BQL(0.002)	1	ND	1	ND	1	BQL(0.002) (RPD=NA)	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	BQL(0.008)	1	ND	1	BQL(0.006) (RPD=NA)	1	BQL(0.011)	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	7.40	1	18.7	1	19.7	1	19.5 (RPD=1.02)	1	18.4	1	12.2	1
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	1.64	1	2.12	1	BQL(0.125)	1	BQL(0.100) (RPD=NA)	1	1.96	1	2.15	1
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	0.086	1	0.986	1	0.564	1	0.566 (RPD=0.35)	1	0.961	1	0.052	1
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory: **Metals** Report Date: **2/11/07**

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Technical Directive: **3ME383HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 213(2)**

Analytes		Unit	Field Sample ID		ML 6-4		ML 6-6		ML 7-2		ML 7-2		ML 7-3		ML 7-4	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.024	1	0.022	1	0.024	1	0.025 (RPD=4.08)	1	0.093	1	0.025	1
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.221	1	0.253	1	1.27	1	1.28 (RPD=0.78)	1	0.389	1	0.262	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.076	1	0.039	1	0.433	1	0.433 (RPD=0.00)	1	0.114	1	0.042	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	37.7	1	45.1	1	122	1	123 (RPD=0.82)	1	34.4	1	47.3	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.002)	1	0.004	1	0.058	1	0.059 (RPD=1.71)	1	0.010	1	BQL(0.004)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	0.006	1	0.006 (RPD=0.00)	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	8.87	1	26.1	1	369	1	370 (RPD=0.27)	1	66.5	1	25.4	1
Potassium (K)	7440-09-7	mg/L	0.055	0.184	1.81	1	2.94	1	5.09	1	5.13 (RPD=0.78)	1	1.65	1	1.48	1
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	7.11	1	9.04	1	54.4	1	54.7 (RPD=0.55)	1	19.5	1	7.68	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.179	1	0.259	1	1.08	1	1.09 (RPD=0.92)	1	0.191	1	0.280	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.004)	1	ND	1	ND (RPD=NA)	1	BQL(0.002)	1	BQL(0.002)	1
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	92.7	1	89.7	1	220	1	220 (RPD=0.00)	1	297	1	92.2	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	ND	1	0.041	1	0.041 (RPD=0.00)	1	BQL(0.006)	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.010)	1	BQL(0.007)	1	ND	1	BQL(0.003) (RPD=NA)	1	0.011	1	BQL(0.007)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	0.020	1	0.015	1	ND	1	ND (RPD=NA)	1	0.018	1	0.017	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.444	1	0.386	1	1.29	1	1.28 (RPD=0.78)	1	0.483	1	0.506	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	BQL(0.001)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.015)	1	BQL(0.013)	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.015)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	BQL(0.003)	1	ND	1	BQL(0.004)	1	BQL(0.004) (RPD=NA)	1	BQL(0.004)	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	16.9	1	20.1	1	19.8	1	20.0 (RPD=1.01)	1	12.1	1	20.4	1
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	1.34	1	1.07	1	ND	1	ND (RPD=NA)	1	5.03	1	1.10	1
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	0.785	1	0.141	1	0.039	1	BQL(0.034) (RPD=NA)	1	0.045	1	0.303	1
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1	BQL(0.012) (RPD=NA)	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. "-" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

Report Date:

2/11/07

Page 7 of 7

Technical Directive:

3ME383HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analysts:	S. Markham/S. Saye	Field Sample ID		ML 7-5		ML 7-6		ML 7-7		DUPLICATE 3								
		Sample Lab ID		3713-14		3713-15		3713-16		3713-17								
		Date Collected		1/25/07		1/25/07		1/25/07		1/25/07								
		Date Analyzed		1/30/07		1/30/07		1/30/07		1/30/07								
Method:	RSKSOP 213(2)	Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF		
		Names	Codes															
		Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1				
		Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	BQL(0.059)	1	ND	1	ND	1	ND	1				
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.017	1	0.031	1	0.021	1	0.030	1						
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.213	1	0.248	1	0.234	1	0.231	1						
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.093	1	0.036	1	0.152	1	0.149	1						
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1						
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	48.9	1	50.2	1	44.4	1	44.0	1						
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.002)	1	BQL(0.002)	1	BQL(0.002)	1						
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1						
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1						
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND	1						
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	15.0	1	15.8	1	13.0	1	12.7	1						
Potassium (K)	7440-09-7	mg/L	0.055	0.184	1.31	1	1.58	1	1.71	1	1.66	1						
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	9.42	1	5.58	1	4.89	1	4.88	1						
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.232	1	0.271	1	0.289	1	0.287	1						
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.003)	1	BQL(0.002)	1	BQL(0.004)	1						
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	82.0	1	181	1	182	1	183	1						
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1						
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	ND	1	BQL(0.002)	1	BQL(0.002)	1						
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.007)	1	BQL(0.007)	1	BQL(0.008)	1	BQL(0.010)	1						
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	0.014	1	0.019	1	BQL(0.008)	1	0.016	1						
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.538	1	0.732	1	0.633	1	0.628	1						
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1						
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	0.019	1	BQL(0.017)	1	0.020	1	0.017	1						
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1						
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	BQL(0.008)	1	BQL(0.007)	1	BQL(0.009)	1	BQL(0.009)	1						
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	21.2	1	20.7	1	19.7	1	19.6	1						
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	1.31	1	0.975	1	1.33	1	1.27	1						
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	1.00	1	0.468	1	0.220	1	0.223	1						
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1	ND	1						

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. "-" denotes that the information is not available or the analyte is not analyzed.

Analytical Report - Analytical Results

Laboratory: IRMS

Report Date: 02/28/07

Tech Dir: 3OA964HW

Date Analyzed: 2/6-16/2007

Method: RSKSOP-296 in Progress

Date Received: 1/23-26/2007

Analyst: Feng Lu

Field Sample ID	IRMS Tracking ID	Lab ID	1000 $\delta^2\text{H}_{\text{VSMOW}}$			1000 $\delta^{18}\text{O}_{\text{VSMOW}}$		
			Measured	Mean	Stdev	Measured	Mean	Stdev
ML2-4 (1/21/07)	3712-0020	3712-4	-22.62			-8.94		
	3712-0021	3712-4D	-18.41			-5.63		
	3712-0022	3712-4D	-17.77			-4.73		
	3712-0023	3712-4D	-16.71			-3.48		
	3712-0024	3712-4D	-17.56			-3.31		
	3712-0025	3712-4D	-16.98	-17.27	0.41	-3.20	-3.26	0.08
ML2-6 (1/21/07)	3712-0026	3712-5	-18.49			-3.54		
	3712-0027	3712-5D	-19.40			-3.40		
	3712-0028	3712-5D	-16.87			-3.32		
	3712-0029	3712-5D	-17.45	-17.16	0.41	-3.47	-3.39	0.11
ML5-4 (1/23/07)	3712-0030	3712-6	-16.34			-3.12		
	3712-0031	3712-6D	-15.49			-2.98		
	3712-0032	3712-6D	-16.26			-2.79		
	3712-0033	3712-6D	-16.23	-16.25	0.02	-3.14	-2.97	0.25
ML5-6 (1/23/07)	3712-0034	3712-7	-17.61			-2.83		
	3712-0035	3712-7D	-16.76			-3.23		
	3712-0036	3712-7D	-17.51			-2.73		
	3712-0037	3712-7D	-17.15	-17.33	0.25	-3.19	-2.96	0.32
Dup2 (Duplicate 2; 1/23/07)	3712-0038	3712-8	-16.29			-2.92		
	3712-0039	3712-8D	-16.54			-3.20		
	3712-0040	3712-8D	-15.94			-2.85		
	3712-0041	3712-8D	-16.61	-16.27	0.47	-2.92	-2.89	0.05
PMW-3 (1/19/07)	3712-0042	3712-9	-16.44			-2.87		
	3712-0043	3712-9D	-15.89			-2.67		
	3712-0044	3712-9D	-16.96			-3.00		
	3712-0045	3712-9D	-16.77	-16.86	0.14	-2.97	-2.98	0.02
PMW-5 (1/19/07)	3712-0046	3712-10	-17.19			-2.97		
	3712-0047	3712-10D	-18.55			-3.45		
	3712-0048	3712-10D	-16.75			-2.86		
	3712-0049	3712-10D	-16.52	-16.64	0.16	-3.18	-3.02	0.23

Comments:

Due to memory effect, typically the first two to four replicates (italic) of each sample were excluded from the calculations for the average (mean) and the standard deviation (stdev).

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

04/03/07

Technical Directive:

3GP967HW

Sample Results (1)

Analyst:

Vanessa Scroggins

Analytes	Nitrite+Nitrate-Nitrogen(NO ₂ +NO ₃ -N)					
Codes	00630					
Methods	FIA 10-107-04-2-A					
Unit	mg/L					
MDL	0.010					
QL	0.100					
Date Analyzed	Data	DF	Data	DF	Data	DF
4/2/2007	BQL (0.029)	1				
4/2/2007	ND	1				
4/2/2007	ND	1				
4/2/2007	ND (RPD=NA)	1				
4/2/2007	ND	1				
4/2/2007	ND	1				
4/2/2007	ND	1				
4/2/2007	ND	1				
4/2/2007	BQL (0.015)	1				
4/2/2007	ND	1				
4/2/2007	BQL (0.035)	1				
4/2/2007	ND (RPD=NA)	1				
4/2/2007	BQL (0.036)	1				
4/2/2007	BQL (0.035)	1				
4/2/2007	ND	1				
4/2/2007	ND	1				
4/2/2007	ND	1				
4/2/2007	ND	1				
4/2/2007	BQL (0.011)	1				
4/2/2007	BQL (0.036)	1				
4/2/2007	BQL (0.034)	1				
4/2/2007	BQL (0.013) (RPD=NA)	1				
4/2/2007	BQL (0.035)	1				
4/2/2007	BQL (0.094)	1				
4/2/2007	BQL (0.054)	1				
4/2/2007	BQL (0.062) (RPD=NA)	1				
4/2/2007	BQL (0.047)	1				

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

04/03/07

Technical Directive:

3GP967HW

Sample Results (1)

Analyst:

Vanessa Scroggins

Analytes	Nitrite+Nitrate-Nitrogen(NO ₂ +NO ₃ -N)		
Codes	00630		
Methods	FIA 10-107-04-2-A		
Unit	mg/L		
MDL	0.010		
QL	0.100		

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF
ML6-3	3801-4	3/27/2007	4/2/2007	ND	1				
ML6-5	3801-5	3/27/2007	4/2/2007	ND	1				
ML6-7	3801-6	3/28/2007	4/2/2007	ND	1				
ML7-3	3801-7	3/28/2007	4/2/2007	BQL (0.036)	1				
ML7-5	3801-8	3/28/2007	4/2/2007	ND	1				
ML7-7	3801-9	3/29/2007	4/2/2007	BQL (0.035)	1				
ML7-7	3801-9 LAB DUP	3/29/2007	4/2/2007	BQL (0.034) (RPD=NA)	1				
DUPLICATE 2	3801-10	3/27/2007	4/2/2007	ND	1				

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set, that are within the calibration range.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all. All the results are corrected with dilution factors (**DF**), if applicable. **NA** - not applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **General Parameters**

Report Date: **04/11/07**

Technical Directive: **3GP967HW**

Analyst: **Kristie Hargrove**

Analytes	Total Inorganic Carbon (TIC)	Total Organic Carbon (TOC)	
Codes	7440-44-0-TIC	7440-44-0-TOC	
Methods	RSKSOP-265 Rev. 2	RSKSOP-265 Rev. 2	
Unit	mg/L	mg/L	
MDL	0.018**	0.062**	
QL	0.500**	0.500**	

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF		
Field Blank	3797-1	3/21/2007	3/28-4/3/07	0.560 (± 0.0034)	1	BQL (0.176) (± 0.0051)	1		
PMW-3	3797-2	3/21/2007	3/28-4/3/07	44.2 (± 0.1978)	4	169 (± 0.1715)	10		
PMW-4	3797-3	3/21/2007	3/28-4/3/07	62.2 (± 0.1227)	4	27.3 (± 0.0176)	4		
PMW-5	3797-4	3/21/2007	3/28-4/3/07	30.1 (± 0.1130)	4	192 (± 0.0785)	20		
DUPLICATE 1	3797-5	3/21/2007	3/28-4/3/07	26.7 (± 0.0483)	4	255 (± 0.0411)	20		
PMW-6	3797-6	3/21/2007	3/28-4/3/07	57.0 (± 0.1186)	4	48.5 (± 0.1551)	4		
ML2-3	3797-7	3/22/2007	3/28-4/3/07	13.2 (± 0.0513)	4	909 (± 0.0568)	80		
ML2-5	3797-8	3/22/2007	3/28-4/3/07	64.9 (± 0.2113)	4	17.8 (± 0.1293)	20		
ML2-7	3797-9	3/22/2007	3/28-4/3/07	77.6 (± 0.0739)	10	13.5 (± 0.0200)	4		
ML4-3	3797-10	3/23/2007	3/28-4/3/07	77.3 (± 0.1218)	4	65.9 (± 0.1082)	4		
ML4-5	3797-11	3/23/2007	3/28-4/3/07	64.3 (± 0.1425)	4	40.0 (± 0.1453)	4		
ML4-5	3797-11 LAB DUP	3/23/2007	3/28-4/3/07	68.7 (± 0.1250) (RPD = 6.62)	4	40.4 (± 0.0355) (RPD = 0.995)	4		
ML4-7	3797-12	3/23/2007	3/28-4/3/07	79.4 (± 0.0792)	10	40.8 (± 0.0414)	4		
ML5-3	3797-13	3/23/2007	3/28-4/3/07	84.7 (± 0.1366)	10	97.9 (± 0.3956)	10		
ML5-5	3797-14	3/23/2007	3/28-4/3/07	42.9 (± 0.1407)	4	154 (± 0.0935)	10		
ML5-7	3797-15	3/23/2007	3/28-4/3/07	60.7 (± 0.1059)	4	148 (± 0.0290)	10		
ML1-3	3797-16	3/24/2007	3/28-4/3/07	104 (± 0.1055)	10	42.4 (± 0.1321)	4		
ML1-5	3797-17	3/24/2007	3/28-4/3/07	93.9 (± 0.0594)	10	29.9 (± 0.1104)	4		
ML1-7	3797-18	3/24/2007	3/28-4/3/07	78.2 (± 0.1194)	4	17.1 (± 0.0345)	4		
PMW-2	3797-19	3/26/2007	3/28-4/3/07	66.3 (± 0.0871)	4	18.3 (± 0.0357)	4		
PMW-2	3797-19 LAB DUP	3/26/2007	3/28-4/3/07	69.1 (± 0.0448) (RPD = 4.14)	4	18.2 (± 0.0301) (RPD = 0.548)	4		
PMW-1	3797-20	3/26/2007	3/28-4/3/07	65.9 (± 0.1384)	4	112 (± 0.0516)	10		

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

04/11/07

Technical Directive:

3GP967HW

Analyst:

Kristie Hargrove

				Analytes		Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)			
				Codes		7440-44-0-TIC		7440-44-0-TOC			
				Methods		RSKSOP-265 Rev. 2		RSKSOP-265 Rev. 2			
				Unit		mg/L		mg/L			
				MDL		0.018**		0.062**			
				QL		0.500**		0.500**			
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data		DF	Data		DF		
ML3-3	3801-1	3/26/2007	4/4-4/10/07	1.35 (±0.0118)		1	1806 (± 0.1661)		100		
ML3-5	3801-2	3/27/2007	4/4-4/10/07	39.7 (± 0.0426)		4	759 (± 0.0613)		40		
ML3-7	3801-3	3/27/2007	4/4-4/10/07	100 (± 0.1669)		4	204 (± 0.0460)		40		
ML6-3	3801-4	3/27/2007	4/4-4/10/07	106 (± 0.0367)		8	55.5 (± 0.1870)		4		
ML6-5	3801-5	3/27/2007	4/4-4/10/07	32.6 (± 0.0120)		8	81.9 (± 0.0563)		8		
ML6-5	3801-5 LAB DUP	3/27/2007	4/4-4/10/07	32.1 (± 0.0233) (RPD = 1.55)		8	82.7 (± 0.0227) (RPD=0.972)		8		
ML6-7	3801-6	3/28/2007	4/4-4/10/07	63.8 (± 0.0189)		8	53.3 (± 0.0772)		4		
ML7-3	3801-7	3/28/2007	4/4-4/10/07	96.5 (± 0.0636)		8	455 (± 0.0723)		40		
ML7-5	3801-8	3/28/2007	4/4-4/10/07	30.3 (± 0.0805)		4	166 (± 0.0558)		40		
ML7-7	3801-9	3/29/2007	4/4-4/10/07	58.7 (± 0.0574)		8	146 (± 0.1650)		10		
DUPLICATE 2	3801-10	3/27/2004	4/4-4/10/07	33.4 (± 0.0300)		8	81.4 (± 0.0248)		10		

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set. The data values are reported with the dilution factors applied.

Notes:

** The MDL and QL should be raised by the same factor as the dilution factor in the samples that were diluted.

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (**DF**), if applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: General Parameters Report Date: 04/04/07

Technical Directive: 3GP967HW

Analyst: Lynda Callaway

Analytes	Chloride (Cl)	Bromide (Br)	Nitrite-N (NO ₂ -N)	Sulfate (as SO ₄)	Nitrate-N (NO ₃ -N)	Fluoride (F)
Codes	16887-00-6	7726-95-6-BR	14797-65-0	14808-79-8	14797-55-8	7782-41-4
Methods	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288
Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MDL	* 0.249	0.433	0.102	* 0.422	0.102	0.106
QL	* 1.00	1.00	0.200	* 1.00	0.200	1.00

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Field Blank	3797-1	3/21/2007	3/28/2007	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
PMW-3	3797-2	3/21/2007	3/28 & 3/29/07	100	11	1.11	1	ND	1	BQL (0.568)	1	ND	1	ND	1
PMW-4	3797-3	3/21/2007	3/28 & 3/29/07	73.8	11	BQL (0.966)	1	ND	1	59.3	11	ND	1	ND	1
PMW-5	3797-4	3/21/2007	3/28/2007	9.27	1	ND	1	ND	1	ND	1	ND	1	ND	1
Duplicate 1	3797-5	3/21/2007	3/28 & 3/29/07	187	11	1.28	1	ND	1	BQL (0.849)	1	ND	1	ND	1
PMW-6	3797-6	3/21/2007	3/28/2007	42.5	1	1.14	1	ND	1	9.41	1	ND	1	BQL (0.188)	1
ML 2-3	3797-7	3/22/2007	3/28 & 3/29/07	724	21	ND	1	ND	1	ND	1	ND	1	BQL (0.209)	1
ML 2-5	3797-8	3/22/2007	3/28/2007	35.9	1	BQL (0.934)	1	ND	1	30.1	1	ND	1	BQL (0.345)	1
ML 2-7	3797-9	3/22/2007	3/28 & 3/29/07	63.7	11	1.04	1	ND	1	47.6	1	ND	1	BQL (0.403)	1
ML 4-3	3797-10	3/23/2007	3/28 & 3/29/07	130	11	1.00	1	ND	1	3.00	1	ND	1	BQL (0.291)	1
ML 4-3	3797-10 Lab dup	3/23/2007	3/28 & 3/29/07	129 (RPD=0.772)	11	1.07 (RPD=6.76)	1	ND (RPD=NA)	1	2.99 (RPD=0.334)	1	ND (RPD=NA)	1	BQL (0.287)(RPD=NA)	1
ML 4-5	3797-11	3/23/2007	3/28 & 3/29/07	67.2	11	BQL (0.885)	1	ND	1	9.89	1	ND	1	BQL (0.219)	1
ML 4-7	3797-12	3/23/2007	3/28 & 3/29/07	80.8	11	BQL (0.882)	1	ND	1	4.83	1	ND	1	BQL (0.321)	1
ML 5-3	3797-13	3/23/2007	3/28 & 3/29/07	203	11	BQL (0.672)	1	ND	1	7.12	1	ND	1	BQL (0.338)	1
ML 5-5	3797-14	3/23/2007	3/28 & 3/29/07	75.2	11	BQL (0.874)	1	ND	1	ND	1	ND	1	ND	1
ML 5-7	3797-15	3/23/2007	3/28 & 3/29/07	91.7	11	1.03	1	ND	1	1.46	1	ND	1	BQL (0.276)	1
ML 1-3	3797-16	3/24/2007	3/28 & 3/29/07	96.0	11	BQL (0.848)	1	ND	1	76.2	11	ND	1	BQL (0.419)	1
ML 1-5	3797-17	3/24/2007	3/28 & 3/29/07	51.4	11	1.08	1	ND	1	54.4	11	ND	1	BQL (0.484)	1
ML 1-7	3797-18	3/24/2007	3/28 & 3/29/07	104	11	BQL (0.934)	1	ND	1	89.8	11	ND	1	BQL (0.418)	1
PMW-2	3797-19	3/26/2007	3/28/2007	37.2	1	BQL (0.856)	1	ND	1	41.4	1	ND	1	BQL (0.135)	1
PMW-1	3797-20	3/26/2007	3/28 & 3/29/07	55.0	11	ND	1	ND	1	3.93	1	ND	1	ND	1
PMW-1	3797-20 Lab dup	3/26/2007	3/28 & 3/29/07	55.6 (RPD=1.08)	11	ND (RPD=NA)	1	ND (RPD=NA)	1	4.03 (RPD=2.51)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
ML 3-3	3801-1	3/26/2007	4/2/2007	105	11	1.18	1	ND	1	ND	1	ND	1	ND	1
ML 3-5	3801-2	3/27/2007	4/2/2007	43.5	1	1.91	1	ND	1	ND	1	ND	1	ND	1
ML 3-7	3801-3	3/27/2007	4/2/2007	98.9	11	BQL (0.988)	1	ND	1	ND	1	ND	1	BQL (0.247)	1
ML 6-3	3801-4	3/27/2007	4/2/2007	146	11	BQL (0.652)	1	ND	1	4.97	1	ND	1	BQL (0.382)	1
ML 6-5	3801-5	3/27/2007	4/2/2007	134	11	1.04	1	ND	1	BQL (0.501)	1	ND	1	BQL (0.108)	1
ML 6-7	3801-6	3/28/2007	4/2/2007	139	11	BQL (0.728)	1	ND	1	ND	1	ND	1	BQL (0.311)	1
ML 7-3	3801-7	3/28/2007	4/2/2007	210	11	BQL (0.876)	1	ND	1	ND	1	ND	1	BQL (0.213)	1
ML 7-5	3801-8	3/28/2007	4/2/2007	79.3	11	1.00	1	ND	1	ND	1	ND	1	BQL (0.130)	1

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory: **General Parameters** Report Date: **04/04/07**Technical Directive: **3GP967HW**Analyst: **Lynda Callaway**

Analytes	Chloride (Cl)	Bromide (Br)	Nitrite-N (NO ₂ -N)	Sulfate (as SO ₄)	Nitrate-N (NO ₃ -N)	Fluoride (F)
Codes	16887-00-6	7726-95-6-BR	14797-65-0	14808-79-8	14797-55-8	7782-41-4
Methods	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288	RSKSOP-288
Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MDL	* 0.249	0.433	0.102	* 0.422	0.102	0.106
QL	* 1.00	1.00	0.200	* 1.00	0.200	1.00

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
ML 7-7	3801-9	3/29/2007	4/2/2007	97.2	11	BQL (0.608)	1	ND	1	ND	1	ND	1	BQL (0.358)	1
ML 7-7	3801-9 Lab dup	3/29/2007	4/2/2007	96.7 (RPD=0.516)	11	BQL (0.635)(RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1	BQL (0.342)(RPD=NA)	1
Duplicate 2	3801-10	3/27/2007	4/2/2007	133	11	BQL (0.713)	1	ND	1	BQL (0.537)	1	ND	1	ND	1

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set within the calibration range. *MDL and QL should be raised by the same factor as the dilution factor for those samples that were diluted. MDL determinations were made for all parameters on 12-11-06, except for bromide which was done on 4-2-07.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (**DF**), if applicable.
2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:Metals

Report Date:4/24/07

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Technical Directive:3ME393HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 213(2)

Field Sample ID		FIELD BLANK		PMW-3		PMW-4		PMW-4		PMW-5		DUPLICATE 1				
Sample Lab ID		3797-01		3797-02		3797-03		3797-03 Lab Dup.*		3797-04		3797-05				
Date Collected		3/21/07		3/21/07		3/21/07		3/21/07		3/21/07		3/21/07				
Date Analyzed		4/10/07		4/10/07		4/10/07		4/10/07		4/10/07		4/10/07				
Analytes		Unit	MDL	QL	Data		DF	Data		DF	Data		DF	Data		DF
Names	Codes				Data	DF		Data	DF		Data	DF				
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1		ND	1		ND (RPD=NA)	1		ND	1	
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	BQL(0.056)	1		BQL(0.099)	1		0.316 (PRD=13.87)	1		BQL(0.102)	1	
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	ND	1		0.019	1		BQL(0.013) (RPD=NA)	1		BQL(0.009)	1	
Boron (B)	7440-42-8	mg/L	0.014	0.049	ND	1		0.231	1		0.217 (RPD=0.92)	1		0.354	1	
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	ND	1		0.056	1		0.087 (RPD=1.16)	1		0.084	1	
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1		ND	1		ND (RPD=NA)	1		ND	1	
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	BQL(0.041)	1		44.2	1		19.1 (RPD=0.00)	1		53.9	1	
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1		BQL(0.002)	1		BQL(0.004) (RPD=NA)	1		0.010	1	
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1		ND	1		ND (RPD=NA)	1		ND	1	
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1		ND	1		ND (RPD=NA)	1		ND	1	
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	BQL(0.013)	1		BQL(0.007)	1		ND (RPD=NA)	1		ND	1	
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	ND	1		19.7	1		34.8 (RPD=0.87)	1		76.4	1	
Potassium (K)	7440-09-7	mg/L	0.061	0.204	ND	1		2.27	1		1.53 (RPD=0.66)	1		4.58	1	
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	ND	1		14.9	1		10.1 (RPD=0.95)	1		13.4	1	
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	ND	1		0.187	1		0.088 (RPD=1.13)	1		0.277	1	
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)	1		BQL(0.003)	1		ND (RPD=NA)	1		BQL(0.002)	1	
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	BQL(0.140)	1		76.2	1		59.8 (RPD=1.86)	1		62.3	1	
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1		ND	1		ND (RPD=NA)	1		ND	1	
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND	1		BQL(0.004)	1		BQL(0.005) (RPD=NA)	1		0.009	1	
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.004)	1		BQL(0.010)	1		BQL(0.007) (RPD=NA)	1		0.011	1	
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.006)	1		ND	1		ND (RPD=NA)	1		ND	1	
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	ND	1		0.233	1		0.116 (RPD=0.00)	1		0.276	1	
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.001)	1		ND	1		0.007 (RPD=15.38)	1		ND	1	
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	ND	1		BQL(0.012)	1		ND (RPD=NA)	1		BQL(0.008)	1	
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	ND	1		BQL(0.006)	1		BQL(0.003) (RPD=NA)	1		BQL(0.006)	1	
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1		ND	1		ND (RPD=NA)	1		ND	1	
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	BQL(0.075)	1		16.1	1		9.90 (RPD=0.91)	1		15.2	1	
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND	1		ND	1		12.2 (RPD=1.65)	1		ND	1	
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	BQL(0.028)	1		0.944	1		0.585 (RPD=1.03)	1		0.661	1	
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1		ND	1		ND (RPD=NA)	1		ND	1	

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

- Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. "-*" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

Report Date:

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Technical Directive:

3ME393HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Field Sample ID		PMW-6		ML 2-3		ML 2-5		ML 2-5		ML 2-7		ML 2-7	
Sample Lab ID		3797-06		3797-07		3797-08		3797-08 Lab Dup.		3797-09		3797-09 Lab Dup.*	
Date Collected		3/21/07		3/22/07		3/22/07		3/22/07		3/22/07		3/22/07	
Date Analyzed		4/10/07		4/9/07		4/10/07		4/10/07		4/11/07		4/11/07	
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.003	0.011	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1
0.040	0.133	BQL(0.059)	1	BQL(0.048)	1	BQL(0.072)	1	BQL(0.085) (RPD=NA)	1	ND	1	ND (RPD=NA)	1
0.006	0.019	ND	1	0.030	1	ND	1	ND (RPD=NA)	1	BQL(0.007)	1	BQL(0.008) (RPD=NA)	1
0.014	0.049	0.169	1	0.739	1	0.151	1	0.151 (RPD=0.00)	1	0.160	1	0.161 (RPD=0.62)	1
0.001	0.004	0.016	1	0.998	1	0.017	1	0.017 (RPD=0.00)	1	0.021	1	0.022 (RPD=4.65)	1
0.001	0.004	ND	1	BQL(0.001)	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1
0.027	0.089	26.8	1	251	1	27.6	1	27.6 (RPD=0.00)	1	32.8	1	33.0 (RPD=0.61)	1
0.001	0.004	ND	1	0.035	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1
0.001	0.004	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1
0.001	0.004	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1
0.006	0.019	BQL(0.008)	1	ND	1	BQL(0.010)	1	BQL(0.009) (RPD=NA)	1	BQL(0.010)	1	BQL(0.010) (RPD=NA)	1
0.006	0.019	11.2	1	249	1	1.25	1	1.26 (RPD=0.80)	1	1.41	1	1.43 (RPD=1.41)	1
0.061	0.204	2.03	1	2.87	1	1.02	1	1.02 (RPD=0.00)	1	1.48	1	1.51 (RPD=2.01)	1
0.027	0.089	5.10	1	86.2	1	3.88	1	3.93 (RPD=1.28)	1	3.59	1	3.61 (RPD=0.56)	1
0.001	0.004	0.119	1	1.45	1	0.114	1	0.114 (RPD=0.00)	1	0.175	1	0.175 (RPD=0.00)	1
0.001	0.004	BQL(0.003)	1	ND	1	BQL(0.004)	1	BQL(0.003) (RPD=NA)	1	BQL(0.004)	1	BQL(0.004) (RPD=NA)	1
0.047	0.155	60.1	1	321	1	71.6	1	72.3 (RPD=0.97)	1	130	1	130 (RPD=0.00)	1
0.003	0.011	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1
0.002	0.008	BQL(0.003)	1	0.027	1	ND	1	BQL(0.003) (RPD=NA)	1	ND	1	ND (RPD=NA)	1
0.003	0.011	BQL(0.008)	1	0.020	1	BQL(0.009)	1	BQL(0.007) (RPD=NA)	1	BQL(0.009)	1	BQL(0.005) (RPD=NA)	1
0.003	0.011	BQL(0.003)	1	ND	1	BQL(0.005)	1	BQL(0.005) (RPD=NA)	1	0.012	1	BQL(0.011) (RPD=NA)	1
0.001	0.004	0.113	1	3.25	1	0.272	1	0.274 (RPD=0.73)	1	0.471	1	0.473 (RPD=0.42)	1
0.001	0.004	ND	1	ND	1	BQL(0.002)	1	BQL(0.001) (RPD=NA)	1	ND	1	ND (RPD=NA)	1
0.006	0.019	BQL(0.008)	1	BQL(0.007)	1	BQL(0.010)	1	BQL(0.012) (RPD=NA)	1	BQL(0.015)	1	BQL(0.013) (RPD=NA)	1
0.002	0.008	BQL(0.003)	1	0.014	1	ND	1	BQL(0.004) (RPD=NA)	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1
0.007	0.022	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.007) (RPD=NA)	1
0.049	0.163	12.7	1	7.32	1	13.3	1	13.3 (RPD=0.00)	1	13.6	1	13.8 (RPD=1.46)	1
0.102	0.341	0.420	1	ND	1	7.33	1	7.34 (RPD=0.14)	1	13.0	1	13.9 (RPD=0.00)	1
0.012	0.041	0.710	1	0.476	1	1.02	1	1.03 (RPD=0.98)	1	0.348	1	0.349 (RPD=0.29)	1
0.008	0.027	ND	1	BQL(0.014)	1	ND	1	ND (RPD=NA)	1	ND	1	ND (RPD=NA)	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. " -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

Metals

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Technical Directive:

3ME393HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	BQL(0.116)	1	0.160	1	BQL(0.044)	1	BQL(0.048)	1	BQL(0.093)	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.047	1	ND	1	ND	1	0.163	1	ND	1	BQL(0.010)	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.213	1	0.152	1	0.152	1	0.301	1	0.184	1	0.195	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.195	1	0.058	1	0.116	1	0.141	1	0.115	1	0.235	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	58.5	1	37.7	1	53.9	1	44.9	1	42.6	1	65.2	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.005	1	ND	1	ND	1	0.009	1	ND	1	BQL(0.001)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	BQL(0.006)	1	ND	1	ND	1	ND	1	BQL(0.007)	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	41.4	1	7.69	1	4.99	1	76.0	1	9.99	1	12.6	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.02	1	1.19	1	1.47	1	1.27	1	1.60	1	1.69	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	23.1	1	8.27	1	5.51	1	25.5	1	10.5	1	8.73	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.270	1	0.174	1	0.328	1	0.156	1	0.181	1	0.414	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.003)	1	BQL(0.002)	1	BQL(0.002)	1	BQL(0.003)	1	BQL(0.002)	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	70.1	1	76.6	1	99.6	1	133	1	67.8	1	108	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	BQL(0.005)	1	ND	1	ND	1	0.010	1	BQL(0.002)	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.010)	1	BQL(0.006)	1	BQL(0.010)	1	BQL(0.010)	1	BQL(0.009)	1	0.015	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	ND	1	BQL(0.007)	1	0.011	1	ND	1	BQL(0.006)	1	0.011	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.729	1	0.345	1	0.729	1	0.427	1	0.415	1	0.926	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.004)	1	ND	1	ND	1	BQL(0.003)	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.015)	1	BQL(0.012)	1	0.023	1	ND	1	BQL(0.018)	1	0.028	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.004)	1	BQL(0.004)	1	ND	1	BQL(0.004)	1	BQL(0.003)	1	BQL(0.003)	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	BQL(0.011)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	7.23	1	12.4	1	13.5	1	7.23	1	15.8	1	16.2	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.177	1	0.916	1	0.544	1	0.551	1	0.882	1	0.325	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. * - * denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory: Metals Report Date: 4/24/07

Technical Directive: 3ME393HW

Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 213(2)

Analysts:	S. Markham/S. Saye		Field Sample ID		ML 5-7		ML 1-3		ML 1-5		ML 1-7		PMW-2		PMW-2		
			Sample Lab ID		3797-15 Lab Dup.		3797-16		3797-17		3797-18		3797-19		3797-19 Lab Dup.*		
			Date Collected		3/23/07		3/24/07		3/24/07		3/24/07		3/26/07		3/26/07		
			Date Analyzed		4/11/07		4/9/07		4/11/07		4/11/07		4/12/07		4/12/07		
Method:	RSKSOP 213(2)		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
	Names	Codes															
	Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
	Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	ND (RPD=NA)	1	BQL(0.104)	1	1.07	1	ND	1	BQL(0.052)	1	ND (RPD=NA)	1
	Arsenic (As)	7440-38-2	mg/L	0.006	0.019	BQL(0.007) (RPD=NA)	1	0.025	1	BQL(0.009)	1	ND	1	BQL(0.010)	1	BQL(0.011) (RPD=NA)	1
	Boron (B)	7440-42-8	mg/L	0.014	0.049	0.193 (RPD=1.03)	1	0.181	1	0.185	1	0.165	1	0.177	1	0.176 (RPD=0.57)	1
	Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.234 (RPD=0.43)	1	0.087	1	0.038	1	0.028	1	0.025	1	0.025 (RPD=0.00)	1
	Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
	Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	65.1 (RPD=0.15)	1	52.7	1	29.8	1	36.9	1	35.3	1	35.4 (RPD=0.28)	1
	Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.001) (RPD=NA)	1	BQL(0.003)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
	Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
	Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
	Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND (RPD=NA)	1	ND	1	BQL(0.010)	1	BQL(0.006)	1	BQL(0.006)	1	ND (RPD=NA)	1
	Iron (Fe)	7439-89-6	mg/L	0.006	0.019	12.6 (RPD=0.00)	1	23.5	1	5.81	1	2.43	1	10.1	1	9.81 (RPD=2.91)	1
	Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.74 (RPD=2.92)	1	2.05	1	1.54	1	1.52	1	1.44	1	1.44 (RPD=0.00)	1
	Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	8.65 (RPD=0.92)	1	15.0	1	4.99	1	4.14	1	8.45	1	8.51 (RPD=0.71)	1
	Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.411 (RPD=0.73)	1	0.254	1	0.178	1	0.191	1	0.106	1	0.106 (RPD=0.00)	1
	Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002) (RPD=NA)	1	BQL(0.003)	1	BQL(0.003)	1	BQL(0.004)	1	BQL(0.004)	1	BQL(0.004) (RPD=NA)	1
	Sodium (Na)	7440-23-5	mg/L	0.047	0.155	107 (RPD=0.93)	1	150	1	156	1	162	1	53.7	1	53.9 (RPD=0.37)	1
	Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
	Lead (Pb)	7439-92-1	mg/L	0.002	0.008	ND (RPD=NA)	1	BQL(0.004)	1	ND	1	ND	1	BQL(0.002)	1	ND (RPD=NA)	1
	Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.008) (RPD=NA)	1	BQL(0.008)	1	BQL(0.007)	1	BQL(0.010)	1	BQL(0.011)	1	BQL(0.009) (RPD=NA)	1
	Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.008) (RPD=NA)	1	ND	1	BQL(0.009)	1	BQL(0.008)	1	BQL(0.006)	1	BQL(0.006) (RPD=NA)	1
	Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.920 (RPD=0.65)	1	0.659	1	0.440	1	0.409	1	0.134	1	0.134 (RPD=0.00)	1
	Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND (RPD=NA)	1	BQL(0.002)	1	0.029	1	BQL(0.002)	1	BQL(0.001)	1	ND (RPD=NA)	1
	Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	0.027 (RPD=3.64)	1	BQL(0.017)	1	BQL(0.010)	1	BQL(0.015)	1	BQL(0.016)	1	BQL(0.019) (RPD=NA)	1
	Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.004) (RPD=NA)	1	BQL(0.003)	1	BQL(0.004)	1	ND	1	BQL(0.003)	1	ND (RPD=NA)	1
	Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
	Sillicon (Si)	7440-21-3	mg/L	0.049	0.163	16.2 (RPD=0.00)	1	7.01	1	12.8	1	14.2	1	13.6	1	13.6 (RPD=0.00)	1
	Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND (RPD=NA)	1	16.7	1	14.7	1	24.4	1	8.47	1	8.40 (RPD=0.83)	1
	Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.320 (RPD=1.55)	1	0.150	1	0.541	1	0.342	1	0.815	1	0.795 (RPD=2.48)	1
	Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

- Notes:
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Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

Metals

Report Date:

4/24/07

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Technical Directive:

3ME393HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		PMW-1		ML 3-3		ML 3-3		ML 3-5		ML 3-7		ML 6-3	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	1.17	1	ND	1	ND (RPD=NA)	1	0.147	1	BQL(0.048)	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	BQL(0.007)	1	0.027	1	0.028 (RPD=3.64)	1	BQL(0.013)	1	ND	1	0.076	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.220	1	1.24	1	1.25 (RPD=0.80)	1	0.502	1	0.324	1	0.218	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.078	1	0.631	1	0.640 (RPD=1.42)	1	0.408	1	0.135	1	0.074	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	BQL(0.002)	1	BQL(0.001) (RPD=NA)	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	59.3	1	231	1	234 (RPD=1.29)	1	130	1	76.9	1	64.8	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.007	1	0.067	1	0.068 (RPD=1.48)	1	0.021	1	0.010	1	BQL(0.003)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	0.005	1	0.005 (RPD=0.00)	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	BQL(0.006)	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	55.2	1	462	1	470 (RPD=1.72)	1	151	1	81.6	1	30.7	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	2.58	1	6.34	1	6.45 (RPD=1.72)	1	23.8	1	1.90	1	1.71	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	7.81	1	115	1	116 (RPD=0.87)	1	26.2	1	12.4	1	20.6	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.299	1	1.14	1	1.14 (RPD=0.00)	1	0.860	1	0.628	1	0.301	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	BQL(0.003)	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	42.2	1	236	1	240 (RPD=1.68)	1	109	1	124	1	141	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	0.015	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	BQL(0.006)	1	0.048	1	0.045 (RPD=6.45)	1	0.013	1	0.011	1	BQL(0.004)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	0.011	1	0.015	1	0.015 (RPD=0.00)	1	0.012	1	BQL(0.006)	1	0.015	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.263	1	3.50	1	3.55 (RPD=1.42)	1	1.01	1	0.640	1	0.805	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	0.025	1	ND	1	ND (RPD=NA)	1	BQL(0.003)	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	BQL(0.010)	1	ND	1	ND (RPD=NA)	1	0.025	1	BQL(0.015)	1	0.020	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.005)	1	0.026	1	0.028 (RPD=7.41)	1	0.008	1	BQL(0.003)	1	BQL(0.007)	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	7.79	1	3.73	1	3.77 (RPD=1.07)	1	10.9	1	13.7	1	10.7	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.440	1	0.630	1	0.659 (RPD=4.50)	1	0.678	1	0.671	1	0.129	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	BQL(0.019)	1	BQL(0.019) (RPD=NA)	1	ND	1	ND	1	ND	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

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Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

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Technical Directive:

3ME393HW

Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML 6-3		ML 6-5		ML 6-7		ML 7-3		ML 7-5		ML 7-5	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	ND (RPD=NA)	1	ND	1	ND	1	ND	1	BQL(0.044)	1	BQL(0.042) (RPD=NA)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	0.080 (RPD=5.13)	1	BQL(0.006)	1	ND	1	0.057	1	ND	1	ND (RPD=NA)	1
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.219 (RPD=0.46)	1	0.191	1	0.182	1	0.446	1	0.182	1	0.184 (RPD=1.09)	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.074 (RPD=0.00)	1	0.126	1	0.166	1	0.159	1	0.137	1	0.138 (RPD=0.73)	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	65.5 (RPD=1.07)	1	48.4	1	58.7	1	46.8	1	53.7	1	53.8 (RPD=0.19)	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.003) (RPD=NA)	1	BQL(0.001)	1	BQL(0.001)	1	0.015	1	BQL(0.002)	1	BQL(0.002) (RPD=NA)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	BQL(0.007) (RPD=NA)	1	ND	1	BQL(0.006)	1	ND	1	ND	1	ND (RPD=NA)	1
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	30.7 (RPD=0.00)	1	12.2	1	12.2	1	116	1	14.7	1	14.7 (RPD=0.00)	1
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.74 (RPD=1.74)	1	3.84	1	2.36	1	1.51	1	1.13	1	1.13 (RPD=0.00)	1
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	20.6 (RPD=0.00)	1	10.5	1	6.42	1	29.5	1	10.0	1	10.1 (RPD=1.00)	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.303 (RPD=0.66)	1	0.208	1	0.307	1	0.265	1	0.253	1	0.256 (RPD=1.18)	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.003) (RPD=NA)	1	BQL(0.003)	1	BQL(0.003)	1	ND	1	BQL(0.003)	1	BQL(0.003) (RPD=NA)	1
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	142 (RPD=0.71)	1	79.5	1	125	1	324	1	71.7	1	71.9 (RPD=0.28)	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	BQL(0.006) (RPD=NA)	1	ND	1	ND	1	0.016	1	ND	1	ND (RPD=NA)	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	BQL(0.011) (RPD=NA)	1	BQL(0.009)	1	BQL(0.011)	1	BQL(0.010)	1	BQL(0.007)	1	0.013 (RPD=NA)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	ND (RPD=NA)	1	BQL(0.006)	1	BQL(0.006)	1	ND	1	BQL(0.005)	1	BQL(0.005) (RPD=NA)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.813 (RPD=0.99)	1	0.384	1	0.833	1	0.651	1	0.587	1	0.589 (RPD=0.34)	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND (RPD=NA)	1	ND	1	BQL(0.003)	1	ND	1	ND	1	ND (RPD=NA)	1
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	0.019 (RPD=5.13)	1	0.021	1	0.027	1	ND	1	0.028	1	0.026 (RPD=7.41)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.006) (RPD=NA)	1	BQL(0.004)	1	BQL(0.003)	1	0.012	1	BQL(0.002)	1	BQL(0.005) (RPD=NA)	1
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	10.7 (RPD=0.00)	1	20.7	1	19.3	1	10.1	1	17.4	1	17.4 (RPD=0.00)	1
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.126 (RPD=2.35)	1	0.791	1	0.191	1	0.184	1	0.851	1	0.853 (RPD=0.23)	1
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. "-" denotes that the information is not available or the analyte is not analyzed.

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		ML 7-7		DUPLICATE 2									
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.011	ND	1	ND	1								
Aluminum (Al)	7429-90-5	mg/L	0.040	0.133	ND	1	ND	1								
Arsenic (As)	7440-38-2	mg/L	0.006	0.019	ND	1	ND	1								
Boron (B)	7440-42-8	mg/L	0.014	0.049	0.194	1	0.190	1								
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.308	1	0.128	1								
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1								
Calcium (Ca)	7440-70-2	mg/L	0.027	0.089	61.7	1	48.2	1								
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.001)	1	BQL(0.001)	1								
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1								
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1								
Copper (Cu)	7440-50-8	mg/L	0.006	0.019	BQL(0.010)	1	BQL(0.008)	1								
Iron (Fe)	7439-89-6	mg/L	0.006	0.019	11.8	1	12.1	1								
Potassium (K)	7440-09-7	mg/L	0.061	0.204	1.94	1	4.06	1								
Magnesium (Mg)	7439-95-4	mg/L	0.027	0.089	6.63	1	10.4	1								
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.405	1	0.208	1								
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.003)	1								
Sodium (Na)	7440-23-5	mg/L	0.047	0.155	152	1	80.3	1								
Nickel (Ni)	7440-02-0	mg/L	0.003	0.011	ND	1	ND	1								
Lead (Pb)	7439-92-1	mg/L	0.002	0.008	BQL(0.003)	1	ND	1								
Antimony (Sb)	7440-36-0	mg/L	0.003	0.011	0.012	1	BQL(0.007)	1								
Selenium (Se)	7782-49-2	mg/L	0.003	0.011	BQL(0.008)	1	BQL(0.007)	1								
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.945	1	0.383	1								
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	BQL(0.001)	1	ND	1								
Thallium (Tl)	7440-28-0	mg/L	0.006	0.019	0.030	1	0.019	1								
Vanadium (V)	7440-62-2	mg/L	0.002	0.008	BQL(0.006)	1	ND	1								
Zinc (Zn)	7440-66-6	mg/L	0.007	0.022	ND	1	ND	1								
Silicon (Si)	7440-21-3	mg/L	0.049	0.163	17.9	1	20.8	1								
Sulfur (S)	7704-34-9	mg/L	0.102	0.341	ND	1	ND	1								
Phosphorus (P)	7723-14-0	mg/L	0.012	0.041	0.142	1	0.803	1								
Uranium (U)	7440-61-1	mg/L	0.008	0.027	ND	1	ND	1								

Comments:

No problems noted. Samples were not analyzed for mercury by ICP since all results for the ICP-MS analysis of mercury were below the ICP MDL. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-213(2) * = digested duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. "-"- denotes that the information is not available or the analyte is not analyzed.

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Sample Results (1, 2)

Analysts:

S. Markham/S. Saye

Method:

RSKSOP 257(1)

Analysts:	S. Markham/S. Saye		Field Sample ID		FIELD BLANK		PMW-3		PMW-3		PMW-4		PMW-4		PMW-5		
			Sample Lab ID		3797-01		3797-02		3797-02 Lab Dup.		3797-03		3797-03 Lab Dup.*		3797-04		
Method:	RSKSOP 257(1)		Date Collected		3/21/07		3/21/07		3/21/07		3/21/07		3/21/07		3/21/07		
			Date Analyzed		4/5, 4/9 & 4/10/07		4/9 & 4/10/07		4/9 & 4/10/07		4/9 & 4/10/07		4/9 & 4/10/07		4/9 & 4/10/07		
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names		Codes															
Arsenic (As)		7440-38-2	µg/L	0.027	0.089	BQL(0.145)	5	18.4	5	18.5 (RPD=0.54)	5	15.9	5	16.0 (RPD=0.63)	5	6.09	5
Chromium (Cr)		7440-47-3	µg/L	0.094	0.352	ND	5	BQL(1.18)	5	BQL(1.13) (RPD=NA)	5	BQL(0.900)	5	BQL(0.985) (RPD=NA)	5	BQL(0.930)	5
Copper (Cu)		7440-50-8	µg/L	0.034	0.115	1.66	5	1.42	5	1.43 (RPD=0.70)	5	1.82	5	1.66 (RPD=9.20)	5	0.785	5
Iron (Fe)		7439-89-6	µg/L	0.251	0.836	ND	5	—	—	—	—	—	—	—	—	—	—
Lead (Pb)		7439-92-1	µg/L	0.020	0.067	ND	5	BQL(0.200)	5	BQL(0.215) (RPD=NA)	5	BQL(0.320)	5	0.445 (RPD=NA)	5	ND	5
Selenium (Se)		7782-49-2	µg/L	0.203	0.677	ND	5	9.52	5	8.25 (RPD=14.29)	5	5.68	5	6.36 (RPD=11.30)	5	9.80	5
Uranium (U)		7440-61-1	µg/L	0.002	0.008	ND	5	BQL(0.035)	5	BQL(0.035) (RPD=NA)	5	0.110	5	0.115 (RPD=4.44)	5	ND	5
Zinc (Zn)		7440-62-2	µg/L	0.123	0.411	5.05	5	2.86	5	2.86 (RPD=0.00)	5	14.7	5	14.0 (RPD=4.88)	5	1.98	5
Mercury (Hg)		7439-97-6	µg/L	0.033	0.111	ND	5	ND	5	ND (RPD=NA)	5	ND	5	ND (RPD=NA)	5	ND	5

Comments:

Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

* = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 257(1)

Field Sample ID		DUPLICATE 1		PMW-6		ML 2-3		ML 2-5		ML 2-7		ML 4-3	
Sample Lab ID		3797-05		3797-06		3797-07		3797-08		3797-09		3797-10	
Date Collected		3/21/07		3/21/07		3/22/07		3/22/07		3/22/07		3/23/07	
Date Analyzed		4/9 & 4/10/07		4/9 & 4/10/07		4/9 & 4/10/07		4/9 & 4/10/07		4/9 & 4/10/07		4/9 & 4/10/07	
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.027	0.089	6.12	5	3.06	5	14.4	5	2.86	5	4.62	5	39.3	5
0.094	0.352	BQL(0.935)	5	BQL(0.435)	5	BQL(1.59)	5	1.90	5	ND	5	ND	5
0.034	0.115	0.740	5	BQL(0.390)	5	0.587	5	1.83	5	0.695	5	BQL(0.376)	5
0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
0.020	0.067	0.455	5	ND	5	0.622	5	0.610	5	1.54	5	0.495	5
0.203	0.677	9.90	5	4.76	5	4.56	5	3.93	5	3.36	5	5.46	5
0.002	0.008	ND	5	ND	5	BQL(0.016)	5	BQL(0.030)	5	0.625	5	ND	5
0.123	0.411	2.29	5	ND	5	ND	5	BQL(1.26)	5	BQL(1.14)	5	22.1	5
0.033	0.111	ND	5	ND	5	ND	5	ND	5	ND	5	ND	5

Comments:
Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).
* = digestion duplicate

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 4-5	ML 4-5	ML 4-7	ML 5-3	ML 5-5	ML 5-5
Sample Lab ID	3797-11	3797-11 Lab Dup.*	3797-12	3797-13	3797-14	3797-14 Lab Dup.
Date Collected	3/23/07	3/23/07	3/23/07	3/23/07	3/23/07	3/23/07
Date Analyzed	4/9 & 4/10/07	4/9 & 4/10/07	4/9 & 4/10/07	4/9 & 4/10/07	4/9 & 4/10/07	4/9 & 4/10/07

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	2.62	5	2.56 (RPD=2.32)	5	2.26	5	142	5	2.12	5	2.34 (RPD=9.87)	5
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	BQL(0.810)	5	BQL(0.745) (RPD=NA)	5	BQL(0.485)	5	ND	5	BQL(1.19)	5	BQL(1.12) (RPD=NA)	5
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	0.880	5	0.665 (RPD=27.83)	5	0.880	5	0.600	5	0.855	5	0.870 (RPD=1.74)	5
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	1.26	5	1.14 (RPD=10.00)	5	1.48	5	0.635	5	1.22	5	1.34 (RPD=9.38)	5
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	5.04	5	4.30 (RPD=15.85)	5	4.07	5	5.92	5	6.19	5	6.42 (RPD=3.65)	5
Uranium (U)	7440-61-1	µg/L	0.002	0.008	0.105	5	0.095 (RPD=1.00)	5	BQL(0.030)	5	ND	5	BQL(0.025)	5	BQL(0.030) (RPD=NA)	5
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	3.46	5	BQL(0.840) (RPD=NA)	5	BQL(1.30)	5	BQL(1.58)	5	BQL(1.81)	5	2.30 (RPD=NA)	5
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	5	ND (RPD=NA)	5	ND	5	ND	5	ND	5	ND (RPD=NA)	5

Comments:

Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

* = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 5-7	ML 1-3	ML 1-5	ML 1-7	PMW-2	PMW-1
Sample Lab ID	3797-15	3797-16	3797-17	3797-18	3797-19	3797-20
Date Collected	3/23/07	3/24/07	3/24/07	3/24/07	3/26/07	3/26/07
Date Analyzed	4/9 & 4/10/07	4/9 & 4/10/07	4/9 & 4/10/07	4/9 & 4/10/07	4/9, 4/10 & 4/11/07	4/9 & 4/10/07

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	3.18	5	18.2	5	5.14	5	4.18		9.51	5	3.77	5
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	BQL(1.04)	5	ND	5	1.88	5	ND		ND	5	BQL(1.69)	5
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	BQL(0.370)	5	BQL(0.452)	5	0.725	5	BQL(0.520)		0.710	5	BQL(0.514)	5
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	1.22	5	0.669	5	1.76	5	1.30	5	0.925	5	0.942	5
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	5.82	5	5.64	5	5.44	5	3.40	5	3.55	5	3.06	5
Uranium (U)	7440-61-1	µg/L	0.002	0.008	ND	5	0.125	5	0.345	5	0.080	5	0.180	5	0.247	5
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	2.90	5	BQL(1.32)	5	BQL(1.38)	5	2.10	5	4.17	5	2.00	5
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	5	ND	5	ND	5	ND	5	ND	5	ND	5

Comments:

Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

* = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: **3ME393HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID		PMW-1		ML 3-3		ML 3-5		ML 3-5		ML 3-7		ML 3-7	
Sample Lab ID		3797-20 Lab Dup.		3801-01		3801-02		3801-02 Lab Dup.*		3801-03		3801-03 Lab Dup.*	
Date Collected		3/26/07		3/26/07		3/27/07		3/27/07		3/27/07		3/27/07	
Date Analyzed		4/9 & 4/10/07		4/9 & 4/10/07		4/9, 4/10 & 4/11/07		4/9, 4/10 & 4/11/07		4/9 & 4/10/07		4/9 & 4/10/07	
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.027	0.089	3.56 (RPD=5.78)	5	6.68	5	6.34	5	6.44 (RPD=1.56)	5	2.22	5	1.96 (RPD=12.44)	5
0.094	0.352	BQL(1.57) (RPD=NA)	5	3.30	5	1.76	5	BQL(1.73) (RPD=NA)	5	ND	5	ND (RPD=NA)	5
0.034	0.115	BQL(0.500) (RPD=NA)	5	1.93	5	0.690	5	0.735 (RPD=6.32)	5	3.74	5	3.40 (RPD=9.52)	5
0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
0.020	0.067	0.924 (RPD=1.93)	5	0.759	5	2.01	5	1.73 (RPD=14.97)	5	1.71	5	1.67 (RPD=2.37)	5
0.203	0.677	3.98 (RPD=26.14)	5	7.44	5	8.65	5	10.3 (RPD=17.41)	5	6.82	5	6.64 (RPD=2.67)	5
0.002	0.008	0.243 (RPD=1.63)	5	ND	5	0.050	5	0.050 (RPD=0.00)	5	BQL(0.012)	5	ND (RPD=NA)	5
0.123	0.411	2.26 (RPD=12.21)	5	BQL(0.755)	5	BQL(1.69)	5	3.60 (RPD=NA)	5	BQL(0.895)	5	BQL(1.00) (RPD=NA)	5
0.033	0.111	ND (RPD=NA)	5	BQL(0.172)	5	ND	5	ND (RPD=NA)	5	ND	5	ND (RPD=NA)	5

Comments:
 Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).
 * = digestion duplicate

Notes:
 1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: **3ME393HW**

Sample Results (1, 2)

Analysts: **S. Markham/S. Saye**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 6-3	ML 6-5	ML 6-5	ML 6-7	ML 7-3	ML 7-5
Sample Lab ID	3801-04	3801-05	3801-05 Lab Dup.	3801-06	3801-07	3801-08
Date Collected	3/27/07	3/27/07	3/27/07	3/28/07	3/28/07	3/28/07
Date Analyzed	4/9 & 4/10/07	4/9, 4/10 & 4/11/07	4/9, 4/10 & 4/11/07	4/9, 4/10 & 4/11/07	4/9 & 4/10/07	4/9, 4/10 & 4/11/07

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.027	0.089	69.0	5	2.95	5	2.69 (RPD=9.22)	5	3.23	5	43.9	5	3.03	5
Chromium (Cr)	7440-47-3	µg/L	0.094	0.352	ND	5	BQL(0.825)	5	BQL(0.690) (RPD=NA)	5	ND	5	BQL(1.04)	5	BQL(1.05)	5
Copper (Cu)	7440-50-8	µg/L	0.034	0.115	BQL(0.526)	5	0.650	5	BQL(0.555) (RPD=NA)	5	0.685	5	0.721	5	BQL(0.300)	5
Iron (Fe)	7439-89-6	µg/L	0.251	0.836	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.020	0.067	0.509	5	1.24	5	1.46 (RPD=16.30)	5	1.41	5	0.659	5	1.08	5
Selenium (Se)	7782-49-2	µg/L	0.203	0.677	4.59	5	4.20	5	3.80 (RPD=10.00)	5	3.14	5	7.20	5	3.48	5
Uranium (U)	7440-61-1	µg/L	0.002	0.008	ND	5	ND	5	ND (RPD=NA)	5	BQL(0.030)	5	BQL(0.018)	5	ND	5
Zinc (Zn)	7440-62-2	µg/L	0.123	0.411	BQL(1.22)	5	3.46	5	3.76 (RPD=8.31)	5	3.41	5	BQL(0.825)	5	3.39	5
Mercury (Hg)	7439-97-6	µg/L	0.033	0.111	ND	5	ND	5	ND (RPD=NA)	5	ND	5	ND	5	ND	5

Comments:
 Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).
 * = digestion duplicate

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts: S. Markham/S. Saye

Method: RSKSOP 257(1)

Field Sample ID		ML 7-7		DUPLICATE 2									
Sample Lab ID		3801-09		3801-10									
Date Collected		3/29/07		3/27/07									
Date Analyzed		4/9, 4/10 & 4/11/07		4/9, 4/10 & 4/11/07									
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.027	0.089	3.28	5	2.94	5								
0.094	0.352	ND	5	BQL(0.645)	5								
0.034	0.115	BQL(0.245)	5	0.615	5								
0.251	0.836	—	—	—	—								
0.020	0.067	1.22	5	1.24	5								
0.203	0.677	3.54	5	3.50	5								
0.002	0.008	ND	5	ND	5								
0.123	0.411	3.99	5	5.28	5								
0.033	0.111	ND	5	ND	5								

Comments:
Field sample digestates were diluted by a factor of five to match the acid concentration of the calibration standards. All other QC results met criteria established in RSKSOP 257(1). The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).
* = digestion duplicate

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Analysts:	Steve Markham				Field Sample ID		FIELD BLANK		PMW-3		PMW-4		PMW-4		PMW-5		DUPLICATE 1	
	Method:				Sample Lab ID		3798-01		3798-02		3798-03		3798-03 Lab Dup.		3798-04		3798-05	
					Date Collected		3/21/07		3/21/07		3/21/07		3/21/07		3/21/07		3/21/07	
					Date Analyzed		3/29, 4/3 & 4/5/07		3/29 & 4/3/07		3/29 & 4/3/07		3/29 & 4/3/07		3/29 & 4/3/07		3/29 & 4/3/07	
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																	
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	ND	1	12.3	1	17.4	1	17.2 (RPD=1.16)	1	3.09	1	3.21	1		
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	BOL(0.288)	1	0.647	1	0.580	1	0.583 (RPD=0.52)	1	0.695	1	0.667	1		
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	ND	1	0.141	1	ND	1	ND (RPD=NA)	1	0.165	1	ND	1		
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	ND	1	—	—	—	—	—	—	—	—	—	—		
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1		
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	ND	1	5.15	1	5.37	1	5.37 (RPD=0.00)	1	5.59	1	5.76	1		
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND	1	0.036	1	0.119	1	0.119 (RPD=0.00)	1	0.008	1	0.010	1		
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	ND	1	0.875	1	12.0	1	12.0 (RPD=0.00)	1	2.41	1	1.45	1		
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	BOL(0.051)	1	ND	1	BOL(0.080)	1	BOL(0.057) (RPD=NA)	1	BOL(0.057)	1	BOL(0.043)	1		

Comments:
 Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:
 1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts:	Steve Markham		Field Sample ID		PMW-6		ML 2-3		ML 2-5		ML 2-7		ML 4-3		ML 4-5	
	Method:	RSKSOP 257(1)	Sample Lab ID		3798-06		3798-07		3798-08		3798-09		3798-10		3798-11	
			Date Collected		3/21/07		3/22/07		3/22/07		3/22/07		3/23/07		3/23/07	
			Date Analyzed		3/29 & 4/3/07		3/29 & 4/3/07		3/29 & 4/3/07		3/29 & 4/3/07		3/29 & 4/3/07		3/29 & 4/3/07	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	2.12	1	17.6	1	2.62	1	4.65	1	56.4	1	1.56	1
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	0.503	1	BQL(0.273)	1	0.384	1	BQL(0.235)	1	0.410	1	BQL(0.287)	1
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	ND	1	BQL(0.085)	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	4.92	1	5.76	1	5.11	1	4.73	1	6.44	1	4.58	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.010	1	BQL(0.003)	1	0.302	1	0.554	1	ND	1	0.043	1
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	ND	1	7.47	1	ND	1	1.21	1	0.558	1	0.409	1
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	BQL(0.035)	1	ND	1	ND	1	ND	1	ND	1	BQL(0.038)	1

Comments:
Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts:	Steve Markham		Field Sample ID Sample Lab ID Date Collected Date Analyzed		ML 4-5		ML 4-7		ML 5-3		ML 5-5		ML 5-7		ML 1-3		
					3798-11 Lab Dup.		3798-12		3798-13		3798-14		3798-15		3798-16		
					3/23/07		3/23/07		3/23/07		3/23/07		3/23/07		3/24/07		
					3/29 & 4/3/07		3/29 & 4/3/07		3/29 & 4/3/07		3/29 & 4/3/07		3/29 & 4/3/07		3/29 & 4/3/07		
Method:	RSKSOP 257(1)																
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes																
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	1.58 (RPD=1.27)	1	1.46	1	177	5	1.03	1	1.56	1	24.4	1	
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	BQL(0.292) (RPD=NA)	1	BQL(0.258)	1	0.319	1	0.590	1	0.563	1	BQL(0.152)	1	
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—	
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	4.54 (RPD=0.88)	1	4.87	1	7.09	1	5.85	1	5.77	1	6.73	1	
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.041 (RPD=4.76)	1	0.016	1	0.012	1	BQL(0.003)	1	ND	1	0.116	1	
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	0.412 (RPD=0.73)	1	0.520	1	BQL(0.162)	1	ND	1	0.699	1	0.285	1	
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND (RPD=NA)	1	ND	1	BQL(0.037)	1	ND	1	ND	1	BQL(0.033)	1	

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Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Analytes		Unit	MDL		QL		Data		DF		Data		DF		Data		DF		Data		DF	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	4.12	1	5.20	1	10.4	1	3.63	1	6.91	1	6.92 (RPD=0.14)	1						
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	BQL(0.284)	1	BQL(0.146)	1	0.487	1	0.475	1	ND	1	ND (RPD=NA)	1						
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	ND	1	ND	1	BQL(0.058)	1	ND	1	0.285	1	0.296 (RPD=3.79)	1						
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—						
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1						
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	5.92	1	4.21	1	4.93	1	3.60	1	3.21	1	3.18 (RPD=0.94)	1						
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.156	1	0.050	1	0.175	1	0.097	1	ND	1	ND (RPD=NA)	1						
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	0.487	1	0.431	1	1.41	1	1.13	1	2.48	1	2.50 (RPD=0.80)	1						
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	BQL(0.036)	1	BQL(0.042)	1	ND	1	ND	1	BQL(0.039)	1	ND (RPD=NA)	1						

Comments:
Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 3-5	ML 3-7	ML 6-3	ML 6-5	ML 6-7	ML 7-3
Sample Lab ID	3802-02	3802-03	3802-04	3802-05	3802-06	3802-07
Date Collected	3/27/07	3/27/07	3/27/07	3/27/07	3/28/07	3/28/07
Date Analyzed	4/2 & 4/3/07	4/2 & 4/3/07	4/2 & 4/3/07	4/2 & 4/3/07	4/2 & 4/3/07	4/2 & 4/3/07

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	1.95	1	1.36	1	94.2	1	1.06	1	2.08	1	55.8	1
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	BQL(0.120)	1	ND	1	0.367	1	0.670	1	0.456	1	0.590	1
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	BQL(0.038)	1	ND	1	ND	1	ND	1	ND	1	BQL(0.049)	1
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	4.28	1	2.10	1	3.03	1	1.83	1	1.81	1	3.75	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	BQL(0.004)	1	BQL(0.007)	1	0.009	1	BQL(0.003)	1	0.029	1	0.022	1
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	0.390	1	2.91	1	1.11	1	BQL(0.243)	1	BQL(0.126)	1	1.77	1
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1	ND	1	BQL(0.038)	1	ND	1	ND	1	ND	1

Comments:

Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(1)**

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.024	0.080	0.859	1	1.66	1	1.14	1						
Chromium (Cr)	7440-47-3	µg/L	0.085	0.317	0.607	1	0.434	1	0.668	1						
Copper (Cu)	7440-50-8	µg/L	0.031	0.104	ND	1	BQL(0.036)	1	ND	1						
Iron (Fe)	7439-89-6	µg/L	0.226	0.753	—	—	—	—	—	—						
Lead (Pb)	7439-92-1	µg/L	0.018	0.060	ND	1	ND	1	ND	1						
Selenium (Se)	7782-49-2	µg/L	0.183	0.610	1.88	1	1.95	1	1.97	1						
Uranium (U)	7440-61-1	µg/L	0.002	0.007	BQL(0.007)	1	ND	1	ND	1						
Zinc (Zn)	7440-62-2	µg/L	0.111	0.370	0.633	1	BQL(0.278)	1	BQL(0.210)	1						
Mercury (Hg)	7439-97-6	µg/L	0.030	0.100	ND	1	ND	1	ND	1						

Comments:
 Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2006, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Laboratory:

Metals

Report Date:

4/12/07

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Technical Directive:

3ME394HW

Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(2)

Analytes		Unit	Field Sample ID		Field Blank		PMW-3		PMW-4		PMW-4		PMW-5		Duplicate1	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND	1	BQL(0.048)	1	BQL(0.050)(RPD=NA)	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	ND	1	0.042	1	0.054	1	0.056(RPD=3.64)	1	0.032	1	0.035	1
Boron (B)	7440-42-8	mg/L	0.013	0.044	ND	1	0.230	1	0.217	1	0.218(RPD=0.46)	1	0.358	1	0.357	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	ND	1	0.059	1	0.086	1	0.086(RPD=0.00)	1	0.092	1	0.092	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	ND	1	43.3	1	18.5	1	18.5(RPD=0.00)	1	53.0	1	52.9	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	BQL(0.004)	1	0.005	1	0.005(RPD=0.00)	1	0.012	1	0.012	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	BQL(0.001)	1	BQL(0.001)(RPD=NA)	1	BQL(0.003)	1	BQL(0.003)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	ND	1	19.5	1	34.0	1	34.0((RPD=0.00)	1	76.2	1	75.3	1
Potassium (K)	7440-09-7	mg/L	0.055	0.184	ND	1	2.23	1	1.47	1	1.53(RPD=4.00)	1	4.58	1	4.54	1
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	ND	1	14.3	1	9.50	1	9.52(RPD=0.21)	1	12.8	1	12.8	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	ND	1	0.183	1	0.086	1	0.086(RPD=0.00)	1	0.271	1	0.271	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	BQL(0.003)	1	BQL(0.003)	1	BQL(0.003)(RPD=NA)	1	ND	1	ND	1
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	ND	1	73.5	1	56.2	1	56.8(RPD=1.06)	1	59.5	1	59.2	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	ND	1	ND	1	BQL(0.004)(RPD=NA)	1	BQL(0.006)	1	0.008	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	ND	1	BQL(0.010)	1	BQL(0.007)	1	BQL(0.008)(RPD=NA)	1	BQL(0.006)	1	0.013	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	ND	1	0.020	1	0.025	1	0.024(RPD=4.08)	1	ND	1	BQL(0.004)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	ND	1	0.230	1	0.113	1	0.113(RPD=0.00)	1	0.273	1	0.271	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND	1	BQL(0.002)(RPD=NA)	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1	BQL(0.016)	1	ND	1	ND(RPD=NA)	1	BQL(0.010)	1	BQL(0.010)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	ND	1	ND	1	BQL(0.004)	1	ND(RPD=NA)	1	BQL(0.005)	1	BQL(0.004)	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	BQL(0.068)	1	16.6	1	9.79	1	9.79(RPD=0.00)	1	15.6	1	15.5	1
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	ND	1	14.1	1	13.6	1	13.5(RPD=0.74)	1	ND	1	ND	1
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	ND	1	1.08	1	0.600	1	0.601(RPD=0.17)	1	1.02	1	1.02	1
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1

Comments:

No problems noted. The MDL and QL'S represent those determined in June 2006, but not yet updated in RSKSOP-213(2)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory: **Metals** Report Date: **4/12/07**

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Technical Directive: **3ME394HW**

Sample Results (1, 2)

Analysts: **Sandra Saye**

Method: **RSKSOP 213(2)**

Analytes		Unit	Field Sample ID		PMW-6		ML2-3		ML2-5		ML2-7		ML4-3		ML4-5	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.039	1	0.067	1	0.036	1	0.040	1	0.092	1	0.035	1
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.178	1	0.773	1	0.152	1	0.160	1	0.234	1	0.146	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.030	1	0.973	1	0.026	1	0.024	1	0.204	1	0.060	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	28.9	1	248	1	26.9	1	32.8	1	57.4	1	37.2	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.002)	1	0.043	1	ND	1	ND	1	0.007	1	BQL(0.001)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	0.004	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	14.6	1	248	1	2.27	1	1.91	1	46.4	1	7.88	1
Potassium (K)	7440-09-7	mg/L	0.055	0.184	2.08	1	2.90	1	1.01	1	1.49	1	0.997	1	1.15	1
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	5.27	1	86.6	1	3.68	1	3.57	1	22.4	1	8.26	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.131	1	1.42	1	0.112	1	0.174	1	0.267	1	0.169	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.003)	1	ND	1	0.004	1	0.005	1	BQL(0.002)	1	0.005	1
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	57.2	1	306	1	67.8	1	126	1	66.7	1	72.9	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	0.025	1	ND	1	ND	1	BQL(0.003)	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.008)	1	0.017	1	BQL(0.008)	1	0.011	1	0.011	1	BQL(0.010)	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	0.027	1	ND	1	0.029	1	0.031	1	0.014	1	0.026	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.124	1	3.10	1	0.270	1	0.459	1	0.697	1	0.325	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.007)	1	BQL(0.008)	1	BQL(0.007)	1	BQL(0.010)	1	BQL(0.014)	1	BQL(0.012)	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	BQL(0.003)	1	0.014	1	ND	1	ND	1	0.007	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	13.0	1	7.47	1	13.5	1	14.2	1	7.67	1	12.5	1
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	2.06	1	ND	1	8.21	1	14.4	1	ND	1	ND	1
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	1.28	1	0.403	1	1.41	1	0.477	1	0.178	1	1.13	1
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	BQL(0.022)	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. The MDL and QL'S represent those determined in June 2006, but not yet updated in RSKSOP-213(2)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. " -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:Metals

Report Date:4/12/07

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Technical Directive:3ME394HW

Sample Results (1, 2)

Analysts:	Sandra Saye		Field Sample ID		ML4-7		ML4-7		ML5-3		ML5-5		ML5-7		ML1-3		
			Sample Lab ID		3798-12		3798-12 Lab Dup		3798-13		3798-14		3798-15		3798-16		
Method:	RSKSOP 213(2)		Date Collected		3/23/07		3/23/07		3/23/07		3/23/07		3/23/07		3/24/07		
			Date Analyzed		4/2/07		4/2/07		4/2/07		4/2/07		4/2/07		4/2/07		
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes																
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	1
Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.027	1	0.023(RPD=16.00)	1	0.257	1	0.037	1	0.035	1	0.069	1	1
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.150	1	0.149(RPD=0.67)	1	0.328	1	0.181	1	0.194	1	0.191	1	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.118	1	0.118(RPD=0.00)	1	0.147	1	0.114	1	0.237	1	0.089	1	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	1
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	53.0	1	52.9(RPD=0.19)	1	44.8	1	42.5	1	64.2	1	53.1	1	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.001)	1	BQL(0.001)(RPD=NA)	1	0.012	1	BQL(0.002)	1	BQL(0.002)	1	BQL(0.004)	1	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	1
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	5.32	1	5.31(RPD=0.19)	1	82.7	1	9.86	1	13.4	1	26.9	1	1
Potassium (K)	7440-09-7	mg/L	0.055	0.184	1.42	1	1.41(RPD=0.71)	1	1.16	1	1.60	1	1.63	1	2.00	1	1
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	5.43	1	5.40(RPD=0.55)	1	25.1	1	10.6	1	8.65	1	15.0	1	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.325	1	0.322(RPD=0.93)	1	0.156	1	0.178	1	0.414	1	0.257	1	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.003)(RPD=NA)	1	BQL(0.004)	1	BQL(0.004)	1	0.005	1	0.005	1	1
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	95.1	1	95.0(RPD=0.11)	1	125	1	64.2	1	99.6	1	141	1	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	BQL(0.002)(RPD=NA)	1	0.008	1	BQL(0.003)	1	BQL(0.003)	1	BQL(0.002)	1	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.009)	1	BQL(0.007)(RPD=NA)	1	0.016	1	0.015	1	0.013	1	0.017	1	1
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	0.021	1	0.021(RPD=0.00)	1	0.029	1	0.027	1	0.030	1	0.035	1	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.703	1	0.703(RPD=0.00)	1	0.411	1	0.398	1	0.864	1	0.641	1	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	0.020	1	0.021(RPD=4.88)	1	ND	1	BQL(0.012)	1	0.022	1	BQL(0.012)	1	1
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	ND	1	BQL(0.003)(RPD=NA)	1	BQL(0.007)	1	BQL(0.003)	1	BQL(0.003)	1	BQL(0.002)	1	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	1
Silicon (Si)	7440-21-3	mg/L	0.044	0.147	13.8	1	13.9(RPD=0.72)	1	7.57	1	16.0	1	16.6	1	7.10	1	1
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	BQL(0.165)	1	BQL(0.196)(RPD=NA)	1	ND	1	ND	1	ND	1	18.1	1	1
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	0.672	1	0.673(RPD=0.15)	1	0.607	1	0.955	1	0.480	1	0.141	1	1
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	1

Comments:

No problems noted. The MD'L and QL'S represent those determined in June 2006, but not yet updated in RSKSOP-213(2)

- Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. " -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

Metals

Report Date:

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Technical Directive:

3ME394HW

Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(2)

Analysts:	Sandra Saye	Field Sample ID		ML1-5		ML1-7		PMW-2		PMW-1		ML3-3		ML3-5				
		Sample Lab ID		3798-17		3798-18		3798-19		3798-20		3802-1		3802-2				
		Date Collected		3/24/07		3/24/07		3/26/07		3/26/07		3/26/07		3/27/07				
		Date Analyzed		4/2/07		4/2/07		4/2/07		4/2/07		4/2/07		4/2/07				
Method:	RSKSOP 213(2)	Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF		
		Names	Codes															
		Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
		Aluminum (Al)	7429-90-5	mg/L	0.036	0.120	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.005	0.017	0.046	1	0.037	1	0.041	1	0.034	1	0.049	1	0.058	1		
Boron (B)	7440-42-8	mg/L	0.013	0.044	0.178	1	0.167	1	0.174	1	0.229	1	1.26	1	0.476	1		
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.036	1	0.031	1	0.027	1	0.080	1	0.632	1	0.399	1		
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
Calcium (Ca)	7440-70-2	mg/L	0.024	0.080	29.9	1	36.5	1	35.8	1	62.7	1	229	1	128	1		
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	BQL(0.001)	1	BQL(0.002)	1	0.008	1	0.073	1	0.022	1		
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	0.007	1	BQL(0.002)	1		
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
Copper (Cu)	7440-50-8	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	5.73	1	3.46	1	12.0	1	59.0	1	450	1	149	1		
Potassium (K)	7440-09-7	mg/L	0.055	0.184	1.45	1	1.46	1	1.44	1	2.55	1	6.40	1	23.1	1		
Magnesium (Mg)	7439-95-4	mg/L	0.024	0.080	4.80	1	3.91	1	8.63	1	7.87	1	114	1	25.2	1		
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.175	1	0.217	1	0.110	1	0.313	1	1.13	1	0.850	1		
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.006	1	0.006	1	BQL(0.004)	1	BQL(0.003)	1	ND	1	ND	1		
Sodium (Na)	7440-23-5	mg/L	0.042	0.140	146	1	153	1	51.0	1	37.4	1	224	1	103	1		
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	ND	1	BQL(0.005)	1	BQL(0.007)	1	0.047	1	0.012	1		
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	0.014	1	BQL(0.009)	1	0.014	1	0.014	1	0.015	1	0.018	1		
Selenium (Se)	7782-49-2	mg/L	0.003	0.010	0.043	1	0.030	1	0.027	1	0.010	1	ND	1	BQL(0.008)	1		
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.418	1	0.415	1	0.133	1	0.266	1	3.33	1	0.973	1		
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.006)	1	BQL(0.015)	1	BQL(0.011)	1	BQL(0.009)	1	ND	1	BQL(0.006)	1		
Vanadium (V)	7440-62-2	mg/L	0.002	0.007	BQL(0.003)	1	ND	1	ND	1	BQL(0.006)	1	0.027	1	0.007	1		
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
Sillicon (Si)	7440-21-3	mg/L	0.044	0.147	11.6	1	14.9	1	12.1	1	6.27	1	3.88	1	9.34	1		
Sulfur (S)	7704-34-9	mg/L	0.092	0.307	15.8	1	26.9	1	9.37	1	ND	1	ND	1	ND	1		
Phosphorus (P)	7723-14-0	mg/L	0.011	0.037	0.556	1	0.455	1	0.966	1	0.411	1	0.493	1	0.732	1		
Uranium (U)	7440-61-1	mg/L	0.007	0.024	ND	1	ND	1	ND	1	ND	1	BQL(0.019)	1	BQL(0.007)	1		

Comments:

No problems noted. The MDL and QL'S represent those determined in June 2006, but not yet updated in RSKSOP-213(2)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **4/12/07** Page 5 of 6

Technical Directive: **3ME394HW** **Sample Results (1, 2)**

Analysts:	Sandra Saye	Field Sample ID			ML3-5		ML3-7		ML6-3		ML6-5		ML6-7		ML7-3		
		Sample Lab ID			3802-2 Lab Dup		3802-3		3802-4		3802-5		3802-6		3802-7		
		Date Collected			3/27/07		3/27/07		3/27/07		3/27/07		3/28/07		3/28/07		
		Date Analyzed			4/2/07		4/2/07		4/2/07		4/2/07		4/2/07		4/2/07		
Method:	RSKSOP 213(2)	Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Analytes																	
Names		Codes															
Silver (Ag)		7440-22-4	mg/L	0.003	0.010	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)		7429-90-5	mg/L	0.036	0.120	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Arsenic (As)		7440-38-2	mg/L	0.005	0.017	0.055(RPD=5.31)	1	0.086	1	0.189	1	0.054	1	0.056	1	0.155	1
Boron (B)		7440-42-8	mg/L	0.013	0.044	0.474(RPD=0.42)	1	0.334	1	0.219	1	0.180	1	0.174	1	0.439	1
Barium (Ba)		7440-39-3	mg/L	0.001	0.004	0.403(RPD=1.00)	1	0.142	1	0.076	1	0.127	1	0.161	1	0.158	1
Beryllium (Be)		7440-41-7	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)		7440-70-2	mg/L	0.024	0.080	129(RPD=0.78)	1	77.6	1	64.9	1	47.6	1	57.2	1	46.0	1
Cadmium (Cd)		7440-43-9	mg/L	0.001	0.004	0.022(RPD=0.00)	1	0.012	1	0.005	1	BQL(0.002)	1	BQL(0.002)	1	0.016	1
Cobalt (Co)		7440-48-4	mg/L	0.001	0.004	BQL(0.002)(RPD=NA)	1	BQL(0.002)	1	ND	1	ND	1	ND	1	BQL(0.002)	1
Chromium (Cr)		7440-47-3	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)		7440-50-8	mg/L	0.005	0.017	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)		7439-89-6	mg/L	0.005	0.017	150(RPD=0.67)	1	85.8	1	33.2	1	11.9	1	13.6	1	112	1
Potassium (K)		7440-09-7	mg/L	0.055	0.184	23.3(RPD=0.86)	1	1.84	1	1.65	1	3.77	1	2.27	1	1.43	1
Magnesium (Mg)		7439-95-4	mg/L	0.024	0.080	25.3(RPD=0.40)	1	12.3	1	20.3	1	10.1	1	6.05	1	28.6	1
Manganese (Mn)		7439-96-5	mg/L	0.001	0.004	0.851(RPD=0.12)	1	0.639	1	0.301	1	0.205	1	0.299	1	0.260	1
Molybdenum (Mo)		7439-98-7	mg/L	0.001	0.004	ND(RPD=NA)	1	0.006	1	0.009	1	0.006	1	0.005	1	0.005	1
Sodium (Na)		7440-23-5	mg/L	0.042	0.140	104(RPD=0.97)	1	117	1	131	1	75.8	1	115	1	300	1
Nickel (Ni)		7440-02-0	mg/L	0.003	0.010	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)		7439-92-1	mg/L	0.002	0.007	0.016(RPD=28.57)	1	BQL(0.007)	1	ND	1	BQL(0.003)	1	BQL(0.003)	1	0.010	1
Antimony (Sb)		7440-36-0	mg/L	0.003	0.010	0.020(RPD=10.53)	1	0.021	1	0.021	1	0.014	1	0.015	1	0.023	1
Selenium (Se)		7782-49-2	mg/L	0.003	0.010	BQL(0.008)(RPD=NA)	1	0.058	1	0.083	1	0.046	1	0.053	1	0.067	1
Strontium (Sr)		7440-24-6	mg/L	0.001	0.004	0.982(RPD=0.92)	1	0.625	1	0.780	1	0.374	1	0.796	1	0.617	1
Titanium (Ti)		7440-32-6	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)		7440-28-0	mg/L	0.005	0.017	BQL(0.006)(RPD=NA)	1	ND	1	ND	1	BQL(0.009)	1	BQL(0.008)	1	ND	1
Vanadium (V)		7440-62-2	mg/L	0.002	0.007	BQL(0.005)(RPD=NA)	1	BQL(0.004)	1	BQL(0.003)	1	BQL(0.005)	1	ND	1	0.012	1
Zinc (Zn)		7440-66-6	mg/L	0.006	0.020	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Sillicon (Si)		7440-21-3	mg/L	0.044	0.147	9.34(RPD=0.00)	1	13.7	1	10.8	1	18.2	1	17.1	1	10.0	1
Sulfur (S)		7704-34-9	mg/L	0.092	0.307	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Phosphorus (P)		7723-14-0	mg/L	0.011	0.037	0.733(RPD=0.14)	1	0.723	1	0.064	1	0.849	1	0.198	1	0.109	1
Uranium (U)		7440-61-1	mg/L	0.007	0.024	BQL(0.013)(RPD=NA)	1	BQL(0.011)	1	ND	1	ND	1	ND	1	BQL(0.013)	1

Comments:

No problems noted. The MDL and QL'S represent those determined in June 2006, but not yet updated in RSKSOP-213(2)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. * -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:Metals

Report Date:4/12/07

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Technical Directive:3ME394HW

Sample Results (1, 2)

Analysts:

Sandra Saye

Field Sample ID

ML7-5

ML7-7

Duplicate 2

Method:

RSKSOP 213(2)

Date Collected

3/28/07

3/29/07

3/27/07

Date Analyzed

4/2/07

4/2/07

4/2/07

Comments:

No problems noted. The MDL and QL'S represent those determined in June 2006, but not yet updated in RSKSOP-213(2)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Analytical Report - Analytical Results

Laboratory: IRMS

Report Date: 04/24/07

Tech Dir: 3OA110HW

Date Analyzed: 4/5-16/2007

Method: RSKSOP-296

Analyst: Feng Lu

Field Sample ID	IRMS Tracking ID	Lab ID	1000 $\delta^2\text{H}_{\text{VSMOW}}$			1000 $\delta^{18}\text{O}_{\text{VSMOW}}$		
			Measured	Mean	Stdev	Measured	Mean	Stdev
ML2-3 (3/22/07)	3797-0019	3797-3	-27.44			-4.10		
	3797-0020	3797-3D	-17.00			-3.49		
	3797-0021	3797-3D	-15.93			-3.77		
	3797-0022	3797-3D	-18.37			-3.94		
	3797-0023	3797-3D	-15.80			-3.79		
	3797-0024	3797-3D	-16.55	-16.18	0.53	-3.80	-3.80	0.01
ML2-5 (3/22/07)	3797-0025	3797-4	-17.32			-3.51		
	3797-0026	3797-4D	-17.30			-3.39		
	3797-0027	3797-4D	-16.88			-3.36		
	3797-0028	3797-4D	-16.80	-16.84	0.06	-3.40	-3.38	0.03
ML5-3 (3/23/07)	3797-0029	3797-5	-18.09			-3.52		
	3797-0030	3797-5D	-17.87			-3.41		
	3797-0031	3797-5D	-17.73			-3.32		
	3797-0032	3797-5D	-17.77	-17.75	0.03	-3.41	-3.36	0.06
ML5-5 (3/23/07)	3797-0033	3797-6	-15.87			-2.91		
	3797-0034	3797-6D	-16.57			-3.09		
	3797-0035	3797-6D	-16.23			-2.95		
	3797-0036	3797-6D	-15.87	-16.05	0.26	-3.05	-3.00	0.08
PMW-3 (3/21/07)	3797-0044	3797-8	-30.32			-6.65		
	3797-0045	3797-8D	-21.30			-4.67		
	3797-0046	3797-8D	-18.32			-4.01		
	3797-0047	3797-8D	-18.14			-3.83		
	3797-0048	3797-8D	-16.63			-3.50		
	3797-0049	3797-8D	-16.85	-16.74	0.15	-3.49	-3.50	0.00
PMW-5 (3/21/07)	3797-0050	3797-9	-18.75			-3.73		
	3797-0051	3797-9D	-17.83			-3.36		
	3797-0052	3797-9D	-15.93			-3.32		
	3797-0053	3797-9D	-16.42	-16.18	0.35	-3.37	-3.34	0.04
Dup1 (3/21/07)	3797-0054	3797-10	-14.07			-3.17		
	3797-0055	3797-10D	-15.91			-3.37		
	3797-0056	3797-10D	-16.10			-3.34		
	3797-0057	3797-10D	-16.47	-16.29	0.27	-3.31	-3.32	0.03

Comments:

Due to memory effect, typically the first two to four replicates (italic) of each sample were excluded from the calculations for the average (mean) and the standard deviation (stdev).

Client EPA
 Project name # Paris Island
 OU Project Ref. # 173
 Number/Type of Samples 7; water
 Analysis Required d13C in 1,1-DCE, t-DCE, c-DCE, TCE, PCE
 Date Received 3/27/2007
 Date Analysis Completed 6/19/2008

Notes: na/nd—peak not acquired (above quantitation limit, if so the sample was rerun with higher dilution x) or compound not detected
 coel — peak coelutes
 highlighted values of 1,1-DCE: abnormal peak geometry, possibly coelution with unidentified compound

Run #	Sample ID	Dilution x	d13C			
			1,1DCE	trans-DCE	cis-DCE	TCE
1651	DUPLICATE 1	12500	na/nd	na/nd	-29.7	-26.9
1654	DUPLICATE 1	6250	na/nd	na/nd	-29.7	-26.6
1667	DUPLICATE 1	100	na/nd	-38.4	na/nd	na/nd
1678	DUPLICATE 1	19	-39.1	-39.1	na/nd	na/nd
1644	ML-2-3	35714	na/nd	na/nd	-26.5	na/nd
1660	ML-2-3	417	na/nd	na/nd	na/nd	-24.6
1664	ML-2-3	50	na/nd	-40.7	na/nd	-26.6
1677	ML-2-3	100	na/nd	na/nd	na/nd	-26.2
1645	ML-2-5	50000	na/nd	na/nd	na/nd	-29
1662	ML-2-5	2500	na/nd	na/nd	-30.5	-33.1
1663	ML-2-5	1923	na/nd	na/nd	-30.5	-33.0
1666	ML-2-5	19	na/nd	-40.9	na/nd	na/nd
1679	ML-2-5	4	-41.9	-42.1	na/nd	na/nd
1647	ML-5-3	25000	na/nd	na/nd	-26.1	na/nd
1652	ML-5-3	16667	na/nd	na/nd	-25.9	na/nd
1655	ML-5-3	417	na/nd	-37.0	na/nd	-23.6
1656	ML-5-3	417	na/nd	-36.4	na/nd	-23.6
1672	ML-5-3	21	-34.7	na/nd	na/nd	-18.5
1673	ML-5-3	13	-34.0	na/nd	na/nd	-18.1
1648	ML-5-5	7143	na/nd	na/nd	-28.1	na/nd
1658	ML-5-5	167	na/nd	na/nd	na/nd	-23.4
1661	ML-5-5	125	na/nd	na/nd	na/nd	-24
1665	ML-5-5	25	na/nd	-40.1	na/nd	na/nd
1676	ML-5-5	5	-39.8	na/nd	na/nd	-14.0
1649	PMW-3	10000	na/nd	na/nd	-28.3	na/nd
1657	PMW-3	83	na/nd	-39.4	na/nd	na/nd
1670	PMW-3	8	-39.2	na/nd	na/nd	-25.3
1674	PMW-3	3	-39.1	na/nd	na/nd	-24.5
1650	PMW-5	12500	na/nd	na/nd	-29.5	-26.9
1668	PMW-5	50	-39.1	-39.7	na/nd	na/nd

	d13C				
	1,1DCE	trans-DCE	cis-DCE	TCE	PCE
DUPLICATE 1	-39.1	-38.8	-29.7	-26.8	-27.9
ML-2-3	coel	-40.7	-26.5	-24.6	-26.4
ML-2-5	-41.9	-41.5	-30.5	-33.1	-29.0
ML-5-3	-34.4	-36.7	-26.0	-23.6	-18.3
ML-5-5	-39.8	-40.1	-28.1	-23.7	-14.0
PMW-3	-39.2	-39.4	-28.3	-25.3	-24.5
PMW-5	-39.1	-39.7	-29.5	-26.9	-28.1

	StDev of replicate d13C				
	1,1DCE	trans-DCE	cis-DCE	TCE	PCE
DUPLICATE 1		0.5	0.0	0.2	0.0
ML-2-3					0.3
ML-2-5		0.8	0.0	0.1	
ML-5-3	0.5	0.4	0.1	0.0	0.3
ML-5-5				0.4	
PMW-3	0.1				

QAQC – external standards

Run #	Sample ID	d13C		
		cis-DCE	TCE	PCE
1643	standard	-25.9	-31.0	-27.2
1653	standard	-25.8	-30.9	-27.4
1659	standard	-25.7	-30.8	-27.3
1669	standard	-26.0	-30.7	-27.4
average d13C		-25.9	-30.9	-27.3
stdev n=3		0.1	0.1	0.1
max stdev n=2		0.2	0.2	0.1
off-line d13C of Std compound		-26.1	-30.7	-27.1

Client EPA
 Project Paris Island/Nano Iron for Source Zones
 OU Project Ref. # 173a
 Number/Type of Samples 7 water samples
 Analysis Required d13C of ethane, ethene, VC
 Date Received: 27-Mar-07
 Date Analysis Completed 14-May-07

Notes: na/nd—peak not acquired (above quantitation limit, if so the sample was rerun with higher dilution x) or compound not detected

Replicate Runs

run #	sample ID	dilution x	d13C		
			ethene	ethane	VC
6120	ML2-3	2500	-37.0	-43.2	-37.0
6129	ML2-3	1000	-37.2	-43.3	-36.5
6122	ML2-5	13	-42.0	-52.6	na/nd
6131	ML2-5	50	-42.1	na/nd	-34.9
6121	ML5-3	5000	-34.6	na/nd	-28.9
6130	ML5-3	5000	-35.0	na/nd	-29.1
6136	ML5-5	167	-38.0	-46.8	-32.3
6143	ML5-5	167	-37.9	-46.1	-32.2
6124	ML5-5	1000	-38.7	na/nd	-32.9
6116	PMW-3	25	na/nd	na/nd	na/nd
6117	PMW-3	500	-41.1	na/nd	-36.7
6128	PMW-3	250	-42.0	na/nd	-36.9
6137	PMW-3	250	-42.0	-48.0	-36.6
6142	PMW-3	250	-41.9	-47.9	-36.7
6125	PMW-5	13	na/nd	-48.9	-35.8
6134	PMW-5	50	na/nd	-47.5	-36.1
6135	PMW-5	250	-41.8	-47.9	na/nd
6144	PMW-5	1000	-41.4	-47.4	na/nd
6127	DUPLICATE	25	na/nd	na/nd	-35.9
6138	DUPLICATE	250	-42.1	-48.1	na/nd
6141	DUPLICATE	500	-42.0	-47.9	na/nd

Averages

sample ID	d13C		
	ethene	ethane	VC
ML2-3	-37.1	-43.3	-36.8
ML2-5	-42.1	-52.6	-34.9
ML5-3	-34.8	nd	-29.0
ML5-5	-38.2	-46.5	-32.5
PMW-3	-41.8	-48.0	-36.7
PMW-5	-41.6	-47.9	-36.0
DUPLICATE	-42.1	-48.0	-35.9

QAQC – precision

sample ID	stdev of replicate d13C		
	ethene	ethane	VC
ML2-3	0.1	0.1	0.4
ML2-5	0.1		
ML5-3	0.3		0.1
ML5-5	0.4	0.5	0.4
PMW-3	0.4	0.1	0.1
PMW-5	0.3	0.7	0.2
DUPLICATE	0.1	0.1	

QAQC – external standards

run #	sample ID	d13C	
		ethene	VC
6115	standard	-28.6	-28.2
6119	standard	-29.1	-28.3
6123	standard	-28.9	-28.4
6126	standard	-28.4	-28.5
6132	standard	-29.4	-29.2
6133	standard	-29	-28.6
6140	standard	-29	-28.5

average Std -28.9 -28.5
 stdev Std n=4 0.3 0.3
 max stdev n=2 0.7 0.7

off-line d13C of std. compound -29.2 -28

tbl_Temp

OurLabID	Sample ID	Delta 37Cl x 1000	State Code	Country Code
J-481	PMW-3	4.71	0	US
J-482	PMW-5	4.55	0	US
J-483	Duplicate 1	4.38	0	US
J-484	ML 2-3	5.43	0	US
J-485	ML 2-5	3.3	0	US
J-486	ML 5-3	5.11	0	US
J-487	ML 5-5	4.85	0	US

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **General Parameters**

Report Date: **08/01/07**

Technical Directive: **4GP994HW**

Analyst: **Kristie Hargrove**

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Analytes		Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)		Total Organic Carbon (TOC)	
				Codes		7440-44-0-TIC		7440-44-0-TOC		7440-44-0-TOC	
				Methods		RSKSOP-265 Rev. 3		RSKSOP-265 Rev. 3		RSKSOP-265 Rev. 3	
				Unit		mg/L		mg/L		mg/L	
				MDL		0.018**		0.062**		0.322**	
				QL		0.100**		0.100**		20.0**	
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF
Field Blank	3987-1	7/11/2007	7/19-7/30/2007	0.391 (± 0.0031)	1	0.110 (± 0.0080)	1	-	-	-	-
PMW-2	3987-2	7/11/2007	7/19-7/30/2007	62.9 (± 0.0912)	8	21.1 (± 0.0134)	4	-	-	-	-
PMW-3	3987-3	7/11/2007	7/19-7/30/2007	49.2 (± 0.0569)	8	53.2 (± 0.1327)	4	-	-	-	-
DUPLICATE 1	3987-4	7/11/2007	7/19-7/30/2007	49.8 (± 0.0475)	8	53.8 (± 0.0918)	4	-	-	-	-
PMW-1	3987-5	7/11/2007	7/19-7/30/2007	50.8 (± 0.0300)	8	-	-	260 (± 1.0692)	4	-	-
PMW-6	3987-6	7/12/2007	7/19-7/30/2007	48.5 (± 0.0411)	8	49.8 (± 0.1137)	4	-	-	-	-
PMW-5	3987-7	7/12/2007	7/19-7/30/2007	30.8 (± 0.0407)	8	-	-	181 (± 0.7589)	4	-	-
PMW-4	3987-8	7/12/2007	7/19-7/30/2007	57.3 (± 0.0575)	8	19.7 (± 0.0526)	4	-	-	-	-
ML1-2	3987-9	7/12/2007	7/19-7/30/2007	102 (± 0.0728)	8	41.2 (± 0.2770)	4	-	-	-	-
ML2-2	3987-10	7/12/2007	7/19-7/30/2007	30.4 (± 0.0332)	8	-	-	640 (± 1.4409)	8	-	-
ML2-2	3987-10 LAB DUP	7/12/2007	7/19-7/30/2007	32.4 (± 0.0475)(RPD=6.37)	8	-	-	-	-	-	-
ML1-4	3987-11	7/12/2007	7/19-7/30/2007	81.3 (± 0.1179)	8	24.0 (± 0.0772)	4	-	-	-	-
ML1-5	3987-12	7/12/2007	7/19-7/30/2007	90.2 (± 0.1013)	8	21.4 (± 0.0410)	4	-	-	-	-
ML1-6	3987-13	7/12/2007	7/19-7/30/2007	65.0 (± 0.0899)	8	12.3 (± 0.0014)	4	-	-	-	-
ML1-7	3987-14	7/13/2007	7/19-7/30/2007	88.3 (± 0.1101)	8	12.8 (± 0.0150)	4	-	-	-	-
ML2-4	3987-15	7/13/2007	7/19-7/30/2007	78.7 (± 0.0530)	8	-	-	133 (± 0.5130)	4	-	-
ML2-5	3987-16	7/13/2007	7/19-7/30/2007	67.2 (± 0.0411)	8	15.6 (± 0.1150)	4	-	-	-	-
ML2-6	3987-17	7/13/2007	7/19-7/30/2007	71.5 (± 0.0851)	8	11.9 (± 0.0228)	4	-	-	-	-
ML2-7	3987-18	7/13/2007	7/19-7/30/2007	85.7 (± 0.0728)	8	14.3 (± 0.0624)	4	-	-	-	-
ML2-7	3987-18 LAB DUP	7/13/2007	7/19-7/30/2007	-	-	14.8 (± 0.0296) (RPD=3.44)	4	-	-	-	-
ML3-2	3987-19	7/13/2007	7/19-7/30/2007	5.48 (± 0.0352)	8	-	-	2451 (± 3.2883)	20	-	-
ML3-4	3987-20	7/14/2007	7/19-7/30/2007	31.9 (± 0.1084)	4	-	-	754 (± 2.4047)	8	-	-
ML3-4	3987-20 LAB DUP	7/14/2007	7/19-7/30/2007	31.0 (± 0.0492) (RPD = 2.86)	4	-	-	-	-	-	-
ML3-5	3987-21	7/14/2007	7/19-7/30/2007	77.5 (± 0.2036)	4	-	-	775 (± 1.2132)	10	-	-
ML3-6	3987-22	7/14/2007	7/19-7/30/2007	56.9 (± 0.3209)	4	-	-	445 (± 0.7747)	10	-	-
ML3-6	3987-22 LAB DUP	7/14/2007	7/19-7/30/2007	-	-	-	-	436 (± 1.3044) (RPD=2.04)	10	-	-
ML3-7	3987-23	7/14/2007	7/19-7/30/2007	103 (± 0.1565)	4	11.2 (± 0.0454)	4	-	-	-	-
ML4-2	3987-24	7/14/2007	7/19-7/30/2007	51.7 (± 0.1782)	8	-	-	616 (± 1.0907)	8	-	-
ML4-4	3987-25	7/16/2007	7/19-7/30/2007	66.0 (± 0.0412)	8	57.9 (± 0.1502)	4	-	-	-	-
ML4-5	3987-26	7/16/2007	7/19-7/30/2007	65.8 (± 0.0582)	8	53.3 (± 0.1201)	4	-	-	-	-
ML4-6	3987-27	7/16/2007	7/19-7/30/2007	68.3 (± 0.0433)	8	45.4 (± 0.1730)	4	-	-	-	-
DUPLICATE 2	3987-28	7/16/2007	7/19-7/30/2007	63.1 (± 0.0503)	8	52.2 (± 0.1683)	4	-	-	-	-
ML4-7	3987-29	7/16/2007	7/19-7/30/2007	85.0 (± 0.0868)	8	51.5 (± 0.2242)	4	-	-	-	-
ML4-7	3987-29 LAB DUP	7/16/2007	7/19-7/30/2007	85.7 (± 0.0668) (RPD = 0.820)	8	-	-	-	-	-	-

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **General Parameters**

Report Date: **08/01/07**

Technical Directive: **4GP994HW**

Analyst: **Kristie Hargrove**

Analyst:	Kristie Hargrove		Analyses	Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)		Total Organic Carbon (TOC)	
			Codes	7440-44-0-TIC		7440-44-0-TOC		7440-44-0-TOC	
			Methods	RSKSOP-265 Rev. 3		RSKSOP-265 Rev. 3		RSKSOP-265 Rev. 3	
			Unit	mg/L		mg/L		mg/L	
			MDL	0.018**		0.062**		0.322**	
			QL	0.100**		0.100**		20.0**	
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF
ML5-2	3994-1	7/16/2007	7/19-7/30/2007	83.1 (± 0.0190)	8	-	-	230 (± 0.7418)	8
ML5-4	3994-2	7/16/2007	7/19-7/30/2007	47.7 (± 0.0247)	8	-	-	113 (± 0.9039)	4
ML5-5	3994-3	7/16/2007	7/19-7/30/2007	50.4 (± 0.0239)	8	-	-	93.0 (± 0.7279)	4
ML5-6	3994-4	7/16/2007	7/19-7/30/2007	66.8 (± 0.0353)	8	75.5 (± 0.0830)	8	-	-
ML5-7	3994-5	7/16/2007	7/19-7/30/2007	95.3 (± 0.0877)	8	60.4 (± 0.0298)	8	-	-
ML6-2	3994-6	7/17/2007	7/19-7/30/2007	72.3 (± 0.0724)	8	-	-	172 (± 0.2546)	8
ML6-4	3994-7	7/17/2007	7/19-7/30/2007	61.3 (± 0.0492)	8	69.0 (± 0.1380)	4	-	-
ML6-5	3994-8	7/17/2007	7/19-7/30/2007	29.5 (± 0.0140)	8	-	-	122 (± 0.7713)	4
ML6-6	3994-9	7/17/2007	7/19-7/30/2007	40.8 (± 0.0413)	8	-	-	88.3 (± 0.6719)	4
ML6-7	3994-10	7/17/2007	7/19-7/30/2007	80.6 (± 0.0849)	8	37.0 (± 0.1298)	4	-	-
ML6-7	3994-10 LAB DUP	7/17/2007	7/19-7/30/2007	-	-	37.1 (± 0.0480) (RPD=0.270)	4	-	-
ML7-2	3994-11	7/17/2007	7/19-7/30/2007	7.25 (± 0.0171)	8	-	-	1719 (± 1.4138)	20
ML7-4	3994-12	7/18/2007	7/19-7/30/2007	53.0 (± 0.0407)	8	-	-	201 (± 1.5191)	4
ML7-5	3994-13	7/18/2007	7/19-7/30/2007	12.9 (± 0.0114)	8	-	-	324 (± 1.4003)	4
ML7-6	3994-14	7/18/2007	7/19-7/30/2007	48.4 (± 0.0270)	8	-	-	273 (± 1.5230)	4
ML7-7	3994-15	7/18/2007	7/19-7/30/2007	61.4 (± 0.0534)	8	-	-	210 (± 1.1109)	4
ML7-7	3994-15 LAB DUP	7/18/2007	7/19-7/30/2007	61.0 (± 0.0524) (RPD=0.654)	8	-	-	205 (± 1.7924) (RPD=2.41)	4

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set. The data values are reported with the dilution factors applied. Due to the wide range of TOC concentrations in the sample sets, the TOC samples were analyzed at a mid-calibration range and at a low-calibration range as is described in RSKSOP-265/3.

Notes:

** The MDL and QL should be raised by the same factor as the dilution factor in the samples that were diluted. New MDL studies have been performed for the Phoenix 8000. The new MDL values are 0.018 for TIC range 0.1-20 mg/L performed on 11-27-06, 0.062 for TOC range 0.1-20 mg/L performed on 10-27-06, and 0.322 for TOC range 20-200 mg/L performed on 7-31-07.

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (**DF**), if applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

07/30/07

Technical Directive:

4GP994HW

Analyst:

Lynda Callaway

Analytes	Chloride (Cl)	Bromide (Br)	Sulfate (as SO ₄)	Fluoride (F)
Codes	16887-00-6	7726-95-6-BR	14808-79-8	7782-41-4
Methods	RSKSOP-288/1	RSKSOP-288/1	RSKSOP-288/1	RSKSOP-288/1
Unit	mg/L	mg/L	mg/L	mg/L
MDL	* 0.079	0.341	* 0.049	0.024
QL	* 1.00	1.00	* 1.00	0.200

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF
ML5-2	3994-1	7/16/2007	7/26 & 7/27/2007	351	11	ND	1	BQL (0.167)	1	ND	1
ML5-4	3994-2	7/16/2007	7/26 & 7/27/2007	58.3	11	BQL (0.521)	1	ND	1	BQL (0.083)	1
ML5-5	3994-3	7/16/2007	7/26 & 7/27/2007	73.7	11	BQL (0.804)	1	BQL (0.200)	1	ND	1
ML5-6	3994-4	7/16/2007	7/26 & 7/27/2007	83.2	11	BQL (0.344)	1	ND	1	ND	1
ML5-7	3994-5	7/16/2007	7/26 & 7/27/2007	118	11	BQL (0.353)	1	ND	1	0.294	1
ML6-2	3994-6	7/17/2007	7/26 & 7/27/2007	251	11	BQL (0.355)	1	BQL (0.697)	1	ND	1
ML6-4	3994-7	7/17/2007	7/26 & 7/27/2007	96.8	11	ND	1	ND	1	BQL (0.058)	1
ML6-4	3994-7 Lab dup	7/17/2007	7/26 & 7/27/2007	97.2 (RPD=0.412)	11	BQL (0.391) (RPD=NA)	1	ND (RPD=NA)	1	BQL (0.068)(RPD=NA)	1
ML6-5	3994-8	7/17/2007	7/26 & 7/27/2007	174	11	BQL (0.612)	1	BQL (0.149)	1	BQL (0.079)	1
ML6-6	3994-9	7/17/2007	7/26 & 7/27/2007	163	11	BQL (0.433)	1	BQL (0.053)	1	ND	1
ML6-7	3994-10	7/17/2007	7/26 & 7/27/2007	168	11	BQL (0.523)	1	ND	1	ND	1
ML7-2	3994-11	7/17/2007	7/26 & 7/27/2007	339	11	BQL (0.470)	1	BQL (0.834)	1	ND	1
ML7-4	3994-12	7/18/2007	7/26 & 7/27/2007	117	11	BQL (0.449)	1	ND	1	ND	1
ML7-5	3994-13	7/18/2007	7/26 & 7/27/2007	149	11	ND	1	ND	1	ND	1
ML7-6	3994-14	7/18/2007	7/26 & 7/27/2007	156	11	ND	1	ND	1	ND	1
ML7-7	3994-15	7/18/2007	7/26 & 7/27/2007	147	11	BQL (0.438)	1	ND	1	ND	1
ML7-7	3994-15 Lab dup	7/18/2007	7/26 & 7/27/2007	146 (RPD=0.683)	11	BQL (0.528) (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples within the calibration range. *MDL and QL should be raised by the same factor as the dilution factor for those samples that were diluted. MDL determinations were made for chloride and sulfate on 7-13-07 and for bromide and fluoride on 7-24-07.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all; NA means not applicable; NSF means not sufficient amount for analyses. All the results are corrected with dilution factors (DF), if applicable.
2. * -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **7/27/07**

Page 1 of 9

Technical Directive: **4ME421HW**

Sample Results (1, 2)

Analysts: **S.Markham/L. Callaway**

Method: **RSKSOP 257(1)**

Analysts:	S.Markham/L. Callaway		Field Sample ID		FIELD BLANK		PMW-2		PMW-2		PMW-3		DUPLICATE 1		PMW-1	
	Sample Lab ID				3987-01		3987-02		3987-02 Lab Dup.		3987-03		3987-04		3987-05	
Method:	RSKSOP 257(1)		Date Collected		7/11/07		7/11/07		7/11/07		7/11/07		7/11/07		7/11/07	
	Date Analyzed		7/18, 7/19 & 7/26/07		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	BQL(0.015)	1	9.80	1	9.55 (RPD=2.58)	1	11.6	1	11.5	1	12.7	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	BQL(0.057)	1	0.427	1	0.412 (RPD=3.58)	1	0.559	1	0.565	1	0.664	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	ND	1	0.379	1	0.379 (RPD=0.00)	1	0.288	1	BQL(0.156)	1	0.549	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	ND	1	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	ND	1	4.74	1	4.75 (RPD=0.21)	1	5.08	1	5.14	1	4.30	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND	1	0.027	1	0.026 (RPD=3.77)	1	BQL(0.005)	1	BQL(0.006)	1	0.106	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	ND	1	0.397	1	0.417 (RPD=4.91)	1	ND	1	ND	1	1.13	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	BQL(0.049)	1	BQL(0.046) (RPD=NA)	1	BQL(0.033)	1	BQL(0.026)	1	ND	1

Comments:
Arsenic, chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2007, but not yet updated in RSKSOP-257(1).

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 7/27/07

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Technical Directive: 4ME421HW

Sample Results (1, 2)

Analysts: S.Markham/L. Callaway

Method: RSKSOP 257(1)

Analysts:	S.Markham/L. Callaway		Field Sample ID		PMW-6		PMW-5		PMW-4		ML 1-2		ML 2-2		ML 1-4	
	RSKSOP 257(1)		Sample Lab ID		3987-06		3987-07		3987-08		3987-09		3987-10		3987-11	
Method:			Date Collected		7/12/07		7/12/07		7/12/07		7/12/07		7/12/07		7/12/07	
			Date Analyzed		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	4.43	1	7.93	1	24.5	1	8.68	1	14.0	1	13.0	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.504	1	0.712	1	0.540	1	0.176	1	0.422	1	0.374	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.250	1	0.460	1	BQL(0.213)	1	0.537	1	1.12	1	BQL(0.135)	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	5.05	1	6.42	1	5.87	1	6.12	1	8.47	1	6.67	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	BQL(0.003)	1	0.011	1	0.034	1	0.021	1	0.023	1	0.013	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	ND	1	0.926	1	7.95	1	3.74	1	0.477	1	0.426	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	BQL(0.025)	1	BQL(0.021)	1	ND	1	BQL(0.027)	1	ND	1	0.060	1

Comments:
Arsenic, chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2007, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **7/27/07**

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Technical Directive: **4ME421HW**

Sample Results (1, 2)

Analysts: **S.Markham/L. Callaway**

Method: **RSKSOP 257(1)**

Field Sample ID	ML 1-4	ML 1-5	ML 1-6	ML 1-7	ML 2-4	ML 2-5
Sample Lab ID	3987-11 Lab Dup.	3987-12	3987-13	3987-14	3987-15	3987-16
Date Collected	7/12/07	7/12/07	7/12/07	7/13/07	7/13/07	7/13/07
Date Analyzed	7/18 & 7/19/07	7/18 & 7/19/07	7/18 & 7/19/07	7/18 & 7/19/07	7/18 & 7/19/07	7/18 & 7/19/07

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	13.0 (RPD=0.00)	1	7.65	1	7.95	1	4.38	1	7.44	1	5.17	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.367 (RPD=1.89)	1	0.349	1	0.180	1	0.127	1	0.606	1	0.377	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	BQL(0.131) (RPD=NA)	1	BQL(0.114)	1	BQL(0.131)	1	0.284	1	0.704	1	2.59	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	0.104	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	6.55 (RPD=1.82)	1	5.76	1	4.25	1	4.35	1	7.09	1	5.30	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.013 (RPD=0.00)	1	0.047	1	0.854	1	0.141	1	0.034	1	0.216	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	0.425 (RPD=0.24)	1	ND	1	1.86	1	BQL(0.196)	1	ND	1	2.53	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	BQL(0.041) (RPD=NA)	1	BQL(0.031)	1	0.062	1	BQL(0.032)	1	ND	1	ND	1

Comments:
 Arsenic, chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2007, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: 4ME421HW

Sample Results (1, 2)

Analysts:	S.Markham/L. Callaway		Field Sample ID		ML 2-6		ML 2-7		ML 3-2		ML 3-4		ML 3-5		ML 3-5	
	Method:	RSKSOP 257(1)	Sample Lab ID		3987-17		3987-18		3987-19		3987-20		3987-21		3987-21 Lab Dup.	
			Date Collected		7/13/07		7/13/07		7/13/07		7/14/07		7/14/07		7/14/07	
			Date Analyzed		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	5.86	1	8.75	1	20.2	1	8.61	1	7.66	1	6.96 (RPD=9.58)	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.229	1	0.285	1	0.583	1	0.261	1	ND	1	ND (RPD=NA)	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	BQL(0.212)	1	1.48	1	3.98	1	1.24	1	1.38	1	1.34 (RPD=2.94)	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	1.38	1	0.363	1	ND	1	ND	1	ND (RPD=NA)	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	5.08	1	4.94	1	18.1	1	8.20	1	9.23	1	8.82 (RPD=4.54)	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.663	1	1.08	1	0.094	1	ND	1	BQL(0.005)	1	BQL(0.005) (RPD=NA)	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	0.883	1	ND	1	5.33	1	ND	1	0.378	1	0.342 (RPD=10.00)	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1

Comments:
Arsenic, chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2007, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
Note that the applicable MDL is given only for the case DF=1.

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Analytical Service Results Report

Laboratory: Metals Report Date: 7/27/07

Technical Directive: 4ME421HW

Sample Results (1, 2)

Analysts: S.Markham/L. Callaway

Method: RSKSOP 257(1)

Analytes		Unit	Field Sample ID		ML 3-6		ML 3-7		ML 4-2		ML 4-4		ML 4-5		ML 4-6	
Names	Codes		Sample Lab ID													
			Date Collected		7/14/07		7/14/07		7/14/07		7/16/07		7/16/07		7/16/07	
			Date Analyzed		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07		7/18 & 7/19/07	
			MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	7.86	1	5.24	1	21.2	1	9.51	1	4.33	1	5.21	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	ND	1	BQL(0.099)	1	0.722	1	0.509	1	0.398	1	0.334	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	BQL(0.223)	1	0.346	1	1.62	1	0.322	1	0.319	1	0.319	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	9.58	1	6.75	1	11.0	1	7.46	1	6.19	1	6.15	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND	1	0.012	1	0.014	1	BQL(0.006)	1	0.020	1	ND	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	BQL(0.143)	1	0.442	1	7.92	1	ND	1	BQL(0.196)	1	BQL(0.127)	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	BQL(0.044)	1	ND	1	ND	1	ND	1	ND	1

Comments:
Arsenic, chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2007, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
Note that the applicable MDL is given only for the case DF=1.

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Laboratory: **Metals**

Report Date: **7/27/07**

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Technical Directive: **4ME421HW**

Sample Results (1, 2)

Analysts: **S.Markham/L. Callaway**

Method: **RSKSOP 257(1)**

Analytes		Unit	Field Sample ID		DUPLICATE 2		ML 4-7		ML 5-2		ML 5-2		ML 5-4		ML 5-5	
Names	Codes		Sample Lab ID													
Arsenic (As)	7440-38-2	µg/L	3987-28				3987-29		3994-01		3994-01 Lab Dup.		3994-02		3994-03	
Chromium (Cr)	7440-47-3	µg/L	7/16/07				7/16/07		7/16/07		7/16/07		7/16/07		7/16/07	
Copper (Cu)	7440-50-8	µg/L	7/18 & 7/19/07				7/18 & 7/19/07		7/25 & 7/26/07		7/25 & 7/26/07		7/25 & 7/26/07		7/25 & 7/26/07	
Iron (Fe)	7439-89-6	µg/L														
Lead (Pb)	7439-92-1	µg/L														
Selenium (Se)	7782-49-2	µg/L														
Uranium (U)	7440-61-1	µg/L														
Zinc (Zn)	7440-66-6	µg/L														
Mercury (Hg)	7439-97-6	µg/L														

Comments:
Arsenic, chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2007, but not yet updated in RSKSOP-257(1).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applical Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: 4ME421HW

Sample Results (1, 2)

Analysts: S.Markham/L. Callaway

Method: RSKSOP 257(1)

Analysts:	S.Markham/L. Callaway		Field Sample ID		ML 5-6		ML 5-7		ML 6-2		ML 6-4		ML 6-5		ML 6-6	
	RSKSOP 257(1)		Sample Lab ID		3994-04		3994-05		3994-06		3994-07		3994-08		3994-09	
Method:			Date Collected		7/16/07		7/16/07		7/17/07		7/17/07		7/17/07		7/17/07	
			Date Analyzed		7/25 & 7/26/07		7/25 & 7/26/07		7/25 & 7/26/07		7/25 & 7/26/07		7/25 & 7/26/07		7/25 & 7/26/07	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	4.56	1	7.19	1	12.6	1	4.18	1	5.02	1	6.76	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.490	1	0.203	1	0.362	1	0.619	1	0.630	1	0.510	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.301	1	0.572	1	0.629	1	0.347	1	0.477	1	0.373	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	5.10	1	5.08	1	5.01	1	5.75	1	5.26	1	4.67	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND	1	ND	1	BQL(0.004)	1	BQL(0.004)	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	ND	1	BQL(0.234)	1	1.36	1	BQL(0.240)	1	BQL(0.138)	1	0.411	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	BQL(0.017)	1	ND	1	ND	1	ND	1	ND	1	BQL(0.040)	1

Comments:
Arsenic, chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2007, but not yet updated in RSKSOP-257(1).

Notes:

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Sample Results (1, 2)

Analysts: S.Markham/L. Callaway

Method: RSKSOP 257(1)

Analysts:	S.Markham/L. Callaway		Field Sample ID		ML 6-6		ML 6-7		ML 7-2		ML 7-4		ML 7-5		ML 7-6		
	RSKSOP 257(1)		Sample Lab ID		3994-09 Lab Dup.		3994-10		3994-11		3994-12		3994-13		3994-14		
Method:			Date Collected		7/17/07		7/17/07		7/17/07		7/18/07		7/18/07		7/18/07		
			Date Analyzed		7/25 & 7/26/07		7/25 & 7/26/07		7/25 & 7/26/07		7/25 & 7/26/07		7/25 & 7/26/07		7/25 & 7/26/07		
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes																
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	6.49 (RPD=4.08)	1	5.90	1	19.6	1	6.14	1	5.60	1	6.71	1	
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.508 (RPD=0.39)	1	0.217	1	1.17	1	0.591	1	0.607	1	0.306	1	
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.362 (RPD=2.99)	1	0.528	1	1.75	1	0.794	1	0.731	1	1.21		
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—	
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	4.78 (RPD=2.33)	1	4.67	1	8.34	1	5.89	1	5.45	1	5.60	1	
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND (RPD=NA)	1	0.011	1	BQL(0.003)	1	ND	1	ND	1	ND		
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	0.352 (RPD=15.47)	1	ND	1	2.75	1	0.696	1	0.586	1	0.310		
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	BQL(0.040) (RPD=NA)	1	BQL(0.032)	1	ND	1	ND	1	ND	1	ND	1	

Comments:
Arsenic, chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2007, but not yet updated in RSKSOP-257(1).

Notes:

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Analytical Service Results Report

Laboratory: Metals Report Date: 7/27/07

Technical Directive: 4ME421HW

Sample Results (1, 2)

Analysts: S.Markham/L. Callaway

Method: RSKSOP 257(1)

Field Sample ID	ML 7-7					
Sample Lab ID	3994-15					
Date Collected	7/18/07					
Date Analyzed	7/25 & 7/26/07					

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	6.67	1										
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.276	1										
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.912	1										
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—										
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1										
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	5.40	1										
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND	1										
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	BQL(0.111)	1										
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1										

Comments:
Arsenic, chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species. The MDL's and QL's reported represent those completed in June 2007, but not yet updated in RSKSOP-257(1).

Notes:

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Note that the applicable MDL is given only for the case DF=1.

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Technical Directive:4ME421HW

Analysts:Sandra Saye

Method:RSKSOP 213(2)

Sample Results (1, 2)

Analysts:	Sandra Saye		Field Sample ID			Field Blank		PMW-2		PMW-2		PMW-3		Duplicate1		PMW-1		
	RSKSOP 213(2)		Sample Lab ID			3987-1		3987-2		3987-2 Lab Dup		3987-3		3987-4		3987-5		
Method:			Date Collected			7/11/07		7/11/07		7/11/07		7/11/07		7/11/07		7/11/07		
			Date Analyzed			7/23/07		7/23/07		7/23/07		7/23/07		7/23/07		7/23/07		
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																	
Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	ND	1	ND	1	ND(RPD=NA)	1	ND	1	BQL(0.031)	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.008	0.027	ND	1	BQL(0.018)	1	BQL(0.017)(RPD=NA)	1	BQL(0.020)	1	BQL(0.019)	1	BQL(0.023)	1	BQL(0.023)	1
Boron (B)	7440-42-8	mg/L	0.004	0.014	ND	1	0.188	1	0.191(RPD=1.58)	1	0.218	1	0.214	1	0.616	1	0.616	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.114	1	0.023	1	0.023(RPD=0.00)	1	0.030	1	0.029	1	0.129	1	0.129	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	ND	1	33.1	1	33.6(RPD=1.50)	1	20.3	1	20.4	1	73.7	1	73.7	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	BQL(0.001)	1	BQL(0.001)	1	0.015	1	0.015	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	BQL(0.002)	1	BQL(0.002)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.008	0.027	ND	1	6.50	1	6.51(RPD=0.15)	1	10.1	1	9.79	1	134	1	134	1
Potassium (K)	7440-09-7	mg/L	0.092	0.307	ND	1	1.15	1	1.18(RPD=2.58)	1	1.37	1	1.35	1	3.27	1	3.27	1
Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	ND	1	6.57	1	6.62(RPD=0.76)	1	7.16	1	7.14	1	10.0	1	10.0	1
Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	ND	1	0.087	1	0.088(RPD=1.14)	1	0.065	1	0.065	1	0.413	1	0.413	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	0.005	1	0.005(RPD=0.00)	1	BQL(0.003)	1	BQL(0.004)	1	ND	1	ND	1
Sodium (Na)	7440-23-5	mg/L	0.091	0.304	ND	1	52.7	1	53.4(RPD=1.32)	1	61.2	1	61.1	1	40.4	1	40.4	1
Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.003	0.010	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	0.012	1	0.012	1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	ND	1	ND	1	BQL(0.005)(RPD=NA)	1	BQL(0.005)	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	mg/L	0.007	0.024	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	BQL(0.001)	1	0.131	1	0.132(RPD=0.76)	1	0.107	1	0.108	1	0.316	1	0.316	1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1	0.031	1	0.032(RPD=3.17)	1	0.017	1	BQL(0.017)	1	0.034	1	0.034	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	BQL(0.004)	1	BQL(0.004)	1
Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	ND	1	BQL(0.026)	1	BQL(0.025)(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.047	0.157	BQL(0.123)	1	14.5	1	14.5(RPD=0.00)	1	17.0	1	17.0	1	8.49	1	8.49	1
Sulfur (S)	7704-34-9	mg/L	0.054	0.180	ND	1	1.42	1	1.38(RPD=2.86)	1	ND	1	ND	1	ND	1	ND	1
Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	ND	1	1.16	1	1.16(RPD=0.00)	1	1.41	1	1.41	1	0.504	1	0.504	1
Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. The MDL and QL'S represent those determined in June 2007, but not yet updated in RSKSOP-213(2)

- Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. " - " denotes that the information is not available or the analyte is not analyzed.

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Technical Directive: 4ME421HW

Sample Results (1, 2)

Analysts: Sandra Saye

Method: RSKSOP 213(2)

Field Sample ID	PMW-6		PMW-5		PMW-4		ML1-2		ML2-2		ML2-2	
Sample Lab ID	3987-6		3987-7		3987-8		3987-9		3987-10		3987-10 Lab Dup	
Date Collected	7/12/07		7/12/07		7/12/07		7/12/07		7/12/07		7/12/07	
Date Analyzed	7/23/07		7/23/07		7/23/07		7/23/07		7/23/07		7/23/07	

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=(NA)	1
Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	ND	1	BQL(0.057)	1	ND	1	ND	1	ND	1	ND(RPD=(NA)	1
Arsenic (As)	7440-38-2	mg/L	0.008	0.027	BQL(0.018)	1	BQL(0.019)	1	0.037	1	BQL(0.026)	1	0.034	1	0.030(RPD=.12.50)	1
Boron (B)	7440-42-8	mg/L	0.004	0.014	0.215	1	0.469	1	0.229	1	0.342	1	1.37	1	1.38(RPD=0.73)	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.031	1	0.094	1	0.059	1	0.172	1	0.221	1	0.221(RPD=0.00)	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=(NA)	1
Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	20.1	1	57.1	1	14.2	1	72.1	1	109	1	109(RPD=0.00)	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.001)	1	0.008	1	BQL(0.002)	1	0.006	1	0.036	1	0.036(RPD=0.00)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	BQL(0.002)	1	ND	1	ND	1	BQL(0.004)	1	BQL(0.004)(RPD=NA)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1
Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1
Iron (Fe)	7439-89-6	mg/L	0.008	0.027	13.0	1	75.5	1	17.0	1	48.3	1	317	1	317(RPD=0.00)	1
Potassium (K)	7440-09-7	mg/L	0.092	0.307	1.29	1	4.38	1	1.15	1	4.15	1	2.67	1	2.70(RPD=1.12)	1
Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	5.18	1	13.3	1	6.54	1	14.1	1	62.9	1	63.0(RPD=0.16)	1
Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	0.083	1	0.281	1	0.056	1	0.514	1	0.813	1	0.814(RPD=0.12)	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.003)	1	BQL(0.003)	1	0.005	1	ND	1	ND(RPD=(NA)	1
Sodium (Na)	7440-23-5	mg/L	0.091	0.304	59.7	1	65.7	1	55.0	1	123	1	101	1	101(RPD=0.00)	1
Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=(NA)	1
Lead (Pb)	7439-92-1	mg/L	0.003	0.010	ND	1	BQL(0.008)	1	ND	1	BQL(0.006)	1	0.029	1	0.028(RPD=3.51)	1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	BQL(0.005)	1	BQL(0.007)	1	BQL(0.004)	1	BQL(0.008)	1	BQL(0.006)	1	BQL(0.007)(RPD=NA)	1
Selenium (Se)	7782-49-2	mg/L	0.007	0.024	ND	1	ND	1	BQL(0.008)	1	ND	1	ND	1	ND(RPD=(NA)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.097	1	0.290	1	0.085	1	0.441	1	0.700	1	0.699(RPD=0.14)	1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=(NA)	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	0.020	1	0.032	1	BQL(0.012)	1	0.044	1	BQL(0.011)	1	BQL(0.010)(RPD=NA)	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	0.015	1	0.015(RPD=0.00)	1
Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	ND	1	BQL(0.020)	1	ND	1	BQL(0.039)	1	ND	1	ND(RPD=(NA)	1
Silicon (Si)	7440-21-3	mg/L	0.047	0.157	17.5	1	20.7	1	14.5	1	7.99	1	15.8	1	15.8(RPD=0.00)	1
Sulfur (S)	7704-34-9	mg/L	0.054	0.180	1.25	1	ND	1	6.86	1	8.13	1	ND	1	ND(RPD=(NA)	1
Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	1.44	1	1.09	1	0.961	1	0.083	1	0.297	1	0.294(RPD=1.02)	1
Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=(NA)	1

Comments:

No problems noted. The MDL and QL S represent those determined in June 2007, but not yet updated in RSKSOP-213(2)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
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Technical Directive: 4ME421HW

Sample Results (1, 2)

Analysts: Sandra Saye

Method: RSKSOP 213(2)

Analytes		Unit	MDL	QL	ML1-4		ML1-5		ML1-6		ML1-7		ML2-4		ML2-5	
Names	Codes				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	ND	1	ND	1	ND	1	ND	1	BQL(0.036)	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.008	0.027	0.027	1	BQL(0.020)	1	BQL(0.022)	1	BQL(0.023)	1	0.029	1	BQL(0.019)	1
Boron (B)	7440-42-8	mg/L	0.004	0.014	0.237	1	0.227	1	0.194	1	0.175	1	0.323	1	0.178	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.039	1	0.036	1	0.027	1	0.039	1	0.301	1	0.030	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	28.2	1	26.9	1	26.6	1	46.5	1	87.4	1	32.2	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.001)	1	ND	1	ND	1	ND	1	BQL(0.002)	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	BQL(0.003)	1
Iron (Fe)	7439-89-6	mg/L	0.008	0.027	9.62	1	6.31	1	4.43	1	3.79	1	22.5	1	2.26	1
Potassium (K)	7440-09-7	mg/L	0.092	0.307	1.63	1	1.65	1	1.50	1	1.79	1	2.38	1	1.28	1
Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	7.84	1	4.05	1	5.69	1	5.23	1	18.2	1	3.85	1
Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	0.130	1	0.151	1	0.137	1	0.235	1	0.384	1	0.137	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.006	1	0.005	1	0.006	1	0.007	1	0.007	1	0.006	1
Sodium (Na)	7440-23-5	mg/L	0.091	0.304	101	1	131	1	144	1	154	1	165	1	61.7	1
Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.003	0.010	BQL(0.003)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	BQL(0.008)	1	BQL(0.009)	1	BQL(0.006)	1	BQL(0.006)	1	BQL(0.010)	1	BQL(0.007)	1
Selenium (Se)	7782-49-2	mg/L	0.007	0.024	BQL(0.010)	1	BQL(0.012)	1	BQL(0.009)	1	BQL(0.008)	1	BQL(0.015)	1	BQL(0.011)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.244	1	0.367	1	0.130	1	0.528	1	1.01	1	0.320	1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	0.026	1	0.025	1	0.023	1	0.040	1	0.054	1	0.027	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	BQL(0.023)	1	BQL(0.020)	1	BQL(0.022)	1	BQL(0.035)	1	0.058	1	BQL(0.029)	1
Silicon (Si)	7440-21-3	mg/L	0.047	0.157	16.4	1	16.3	1	18.5	1	19.2	1	23.4	1	17.0	1
Sulfur (S)	7704-34-9	mg/L	0.054	0.180	5.76	1	7.95	1	13.9	1	7.88	1	ND	1	6.31	1
Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	1.01	1	0.845	1	0.950	1	0.729	1	0.402	1	1.61	1
Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. The MDL and QL'S represent those determined in June 2007, but not yet updated in RSKSOP-213(2)

- Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
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Technical Directive:

4ME421HW

Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(2)

Analytes		Unit	MDL	QL	ML2-6		ML2-7		ML3-2		ML3-4		ML3-4		ML3-5	
Names	Codes				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	ND	1	ND	1	0.260	1	ND	1	ND(RPD=NA)	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.008	0.027	BQL(0.023)	1	BQL(0.021)	1	BQL(0.025)	1	BQL(0.021)	1	BQL(0.020)(RPD=NA)	1	0.032	1
Boron (B)	7440-42-8	mg/L	0.004	0.014	0.188	1	0.191	1	1.64	1	0.808	1	0.809(RPD=0.12)	1	0.896	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.023	1	0.037	1	2.72	1	0.251	1	0.249(RPD=0.80)	1	0.459	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	38.1	1	49.9	1	303	1	116	1	115(RPD=0.87)	1	136	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	0.044	1	0.020	1	0.020(RPD=0.00)	1	0.023	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	0.005	1	BQL(0.003)	1	BQL(0.003)(RPD=NA)	1	BQL(0.003)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.008	0.027	3.82	1	2.61	1	381	1	178	1	179(RPD=0.56)	1	210	1
Potassium (K)	7440-09-7	mg/L	0.092	0.307	1.58	1	2.00	1	290	1	22.8	1	22.6(RPD=0.88)	1	33.4	1
Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	5.73	1	4.23	1	77.2	1	19.1	1	19.1(RPD=0.00)	1	29.2	1
Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	0.146	1	0.239	1	1.15	1	0.432	1	0.433(RPD=0.23)	1	0.853	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.007	1	0.007	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1
Sodium (Na)	7440-23-5	mg/L	0.091	0.304	87.6	1	134	1	691	1	83.1	1	82.3(RPD=0.97)	1	122	1
Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.003	0.010	ND	1	ND	1	0.032	1	0.016	1	0.016(RPD=0.00)	1	0.020	1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	BQL(0.007)	1	BQL(0.007)	1	ND	1	BQL(0.007)	1	BQL(0.007)(RPD=NA)	1	BQL(0.008)	1
Selenium (Se)	7782-49-2	mg/L	0.007	0.024	BQL(0.008)	1	BQL(0.010)	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.368	1	0.762	1	7.14	1	1.28	1	1.27(RPD=0.78)	1	1.15	1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	0.028	1	0.039	1	0.032	1	0.038	1	0.037(RPD=2.67)	1	0.040	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1	ND	1	0.015	1	BQL(0.007)	1	ND(RPD=NA)	1	BQL(0.007)	1
Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	BQL(0.027)	1	0.055	1	BQL(0.044)	1	BQL(0.019)	1	ND(RPD=NA)	1	BQL(0.021)	1
Silicon (Si)	7440-21-3	mg/L	0.047	0.157	17.5	1	17.6	1	6.07	1	15.0	1	15.0(RPD=0.00)	1	11.2	1
Sulfur (S)	7704-34-9	mg/L	0.054	0.180	6.88	1	12.0	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1
Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	1.08	1	0.403	1	0.307	1	1.07	1	1.08(RPD=0.93)	1	0.736	1
Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND	1	ND	1	BQL(0.017)	1	ND	1	ND(RPD=NA)	1	ND	1

Comments:

No problems noted. The MDL and QL's represent those determined in June 2007, but not yet updated in RSKSOP-213(2)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
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Technical Directive:

4ME421HW

Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(2)

Analysts:	Sandra Saye		Field Sample ID		ML3-6		ML3-7		ML4-2		ML4-4		ML4-5		ML4-6			
			Sample Lab ID		3987-22		3987-23		3987-24		3987-25		3987-26		3987-27			
			Date Collected		7/14/07		7/14/07		7/14/07		7/16/07		7/16/07		7/16/07			
	Method:		Date Analyzed		7/23/07		7/23/07		7/23/07		7/23/07		7/23/07		7/23/07			
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																	
Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.008	0.027	BQL(0.019)	1	BQL(0.024)	1	0.032	1	BQL(0.025)	1	BQL(0.018)	1	BQL(0.021)	1		1
Boron (B)	7440-42-8	mg/L	0.004	0.014	0.987	1	0.256	1	1.35	1	0.253	1	0.198	1	0.208	1		1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.039	1	0.087	1	0.762	1	0.197	1	0.107	1	0.091	1		1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		1
Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	33.6	1	47.1	1	133	1	42.4	1	43.8	1	42.6	1		1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.025	1	BQL(0.004)	1	0.029	1	BQL(0.002)	1	ND	1	BQL(0.001)	1		1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	0.005	1	ND	1	BQL(0.003)	1	ND	1	ND	1	ND	1		1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		1
Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		1
Iron (Fe)	7439-89-6	mg/L	0.008	0.027	223	1	33.6	1	254	1	18.0	1	8.79	1	12.3	1		1
Potassium (K)	7440-09-7	mg/L	0.092	0.307	2.24	1	1.76	1	10.2	1	1.51	1	1.31	1	1.38	1		1
Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	12.2	1	7.60	1	53.0	1	10.4	1	8.79	1	9.14	1		1
Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	0.362	1	0.374	1	0.845	1	0.202	1	0.202	1	0.208	1		1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	ND	1	0.005	1	ND	1	0.005	1	0.005	1	0.005	1		1
Sodium (Na)	7440-23-5	mg/L	0.091	0.304	111	1	113	1	218	1	66.7	1	69.6	1	80.9	1		1
Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		1
Lead (Pb)	7439-92-1	mg/L	0.003	0.010	0.021	1	BQL(0.004)	1	0.023	1	ND	1	ND	1	ND	1		1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	ND	1	BQL(0.010)	1	BQL(0.010)	1	BQL(0.006)	1	BQL(0.006)	1	BQL(0.006)	1		1
Selenium (Se)	7782-49-2	mg/L	0.007	0.024	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.313	1	0.385	1	1.82	1	0.494	1	0.399	1	0.339	1		1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1	0.035	1	0.027	1	0.036	1	0.038	1	0.030	1		1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	BQL(0.006)	1	ND	1	BQL(0.012)	1	ND	1	ND	1	ND	1		1
Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	ND	1	BQL(0.024)	1	ND	1	BQL(0.026)	1	BQL(0.030)	1	BQL(0.031)	1		1
Silicon (Si)	7440-21-3	mg/L	0.047	0.157	15.0	1	20.0	1	9.22	1	17.3	1	17.7	1	17.5	1		1
Sulfur (S)	7704-34-9	mg/L	0.054	0.180	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		1
Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	0.689	1	1.07	1	0.235	1	1.01	1	1.21	1	1.00	1		1
Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		1

Comments:

No problems noted. The MDL and QL'S represent those determined in June 2007, but not yet updated in RSKSOP-213(2)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: **4ME421HW**

Sample Results (1, 2)

Analysts: **Sandra Saye**

Method: **RSKSOP 213(2)**

Analysts:	Sandra Saye		Field Sample ID		DUPLICATE2		ML4-7		ML5-2		ML5-4		ML5-5		ML5-6			
			Sample Lab ID		3987-28		3987-29		3994-1		3994-2		3994-3		3994-4			
Method:	RSKSOP 213(2)		Date Collected		7/16/07		7/16/07		7/16/07		7/16/07		7/16/07		7/16/07			
			Date Analyzed		7/23/07		7/23/07		7/23/07		7/23/07		7/23/07		7/23/07			
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																	
Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	ND	1	ND	1	ND	1	BQL(0.048)	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.008	0.027	BQL(0.021)	1	BQL(0.018)	1	0.049	1	BQL(0.026)	1	BQL(0.025)	1	BQL(0.020)	1	BQL(0.020)	1
Boron (B)	7440-42-8	mg/L	0.004	0.014	0.199	1	0.193	1	0.849	1	0.216	1	0.226	1	0.253	1	0.253	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.106	1	0.276	1	0.252	1	0.042	1	0.138	1	0.078	1	0.078	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	43.9	1	76.4	1	66.7	1	32.8	1	46.0	1	45.0	1	45.0	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	0.019	1	ND	1	BQL(0.001)	1	BQL(0.002)	1	BQL(0.002)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	BQL(0.002)	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.008	0.027	8.75	1	9.48	1	167	1	8.47	1	12.9	1	18.8	1	18.8	1
Potassium (K)	7440-09-7	mg/L	0.092	0.307	1.27	1	1.69	1	3.40	1	3.15	1	2.08	1	1.38	1	1.38	1
Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	8.85	1	7.29	1	35.9	1	11.1	1	9.98	1	8.12	1	8.12	1
Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	0.201	1	0.443	1	0.299	1	0.090	1	0.222	1	0.253	1	0.253	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.006	1	0.007	1	ND	1	0.006	1	0.007	1	0.006	1	0.006	1
Sodium (Na)	7440-23-5	mg/L	0.091	0.304	70.0	1	106	1	174	1	66.6	1	70.5	1	95.6	1	95.6	1
Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.003	0.010	ND	1	ND	1	0.014	1	ND	1	ND	1	ND	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	BQL(0.004)	1	BQL(0.010)	1	BQL(0.011)	1	BQL(0.007)	1	BQL(0.008)	1	BQL(0.010)	1	BQL(0.010)	1
Selenium (Se)	7782-49-2	mg/L	0.007	0.024	ND	1	ND	1	ND	1	BQL(0.019)	1	BQL(0.014)	1	BQL(0.014)	1	BQL(0.014)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.398	1	0.942	1	0.565	1	0.202	1	0.454	1	0.396	1	0.396	1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	0.038	1	0.052	1	0.019	1	0.026	1	0.034	1	0.039	1	0.039	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1	ND	1	BQL(0.006)	1	ND	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	BQL(0.031)	1	BQL(0.054)	1	ND	1	BQL(0.021)	1	BQL(0.031)	1	BQL(0.029)	1	BQL(0.029)	1
Silicon (Si)	7440-21-3	mg/L	0.047	0.157	17.8	1	18.0	1	8.29	1	19.2	1	20.1	1	20.2	1	20.2	1
Sulfur (S)	7704-34-9	mg/L	0.054	0.180	ND	1	ND	1	ND	1	15.8	1	ND	1	ND	1	ND	1
Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	1.22	1	0.643	1	0.175	1	1.24	1	0.962	1	0.736	1	0.736	1
Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. The MDL and QL'S represent those determined in June 2007, but not yet updated in RSKSOP-213(2)

- Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. " -" denotes that the information is not available or the analyte is not analyzed.

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Technical Directive:4ME421HW

Analysts:Sandra Saye

Method:RSKSOP 213(2)

Sample Results (1, 2)

Analysts:	Sandra Saye		Field Sample ID			ML5-6		ML5-7		ML6-2		ML6-4		ML6-5		ML6-6			
	RSKSOP 213(2)					Sample Lab ID		3994-4 Lab Dup		3994-5		3994-6		3994-7		3994-8		3994-9	
						Date Collected		7/16/07		7/16/07		7/17/07		7/17/07		7/17/07		7/17/07	
						Date Analyzed		7/23/07		7/23/07		7/23/07		7/23/07		7/23/07		7/23/07	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF			
Names	Codes																		
	Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1		
	Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	ND(RPD=NA)	1	ND	1	ND	1	ND	1	BQL(0.038)	1	ND	1		
	Arsenic (As)	7440-38-2	mg/L	0.008	0.027	BQL(0.024)(RPD=NA)	1	0.036	1	0.036	1	0.027	1	0.027	1	BQL(0.025)	1		
	Boron (B)	7440-42-8	mg/L	0.004	0.014	0.253(RPD=0.00)	1	0.197	1	0.598	1	0.238	1	0.234	1	0.273	1		
	Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.078(RPD=0.00)	1	0.291	1	0.147	1	0.195	1	0.179	1	0.085	1		
	Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1		
	Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	45.0(RPD=0.00)	1	70.2	1	70.0	1	45.1	1	63.8	1	55.7	1		
	Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.002)(RPD=NA)	1	BQL(0.001)	1	0.014	1	BQL(0.001)	1	BQL(0.002)	1	BQL(0.003)	1		
	Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	BQL(0.002)	1	ND	1	ND	1	ND	1		
	Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1		
	Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1		
	Iron (Fe)	7439-89-6	mg/L	0.008	0.027	18.9(RPD=0.53)	1	10.4	1	122	1	10.7	1	18.0	1	28.0	1		
	Potassium (K)	7440-09-7	mg/L	0.092	0.307	1.42(RPD=2.86)	1	2.04	1	17.6	1	3.07	1	3.91	1	2.87	1		
	Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	8.08(RPD=0.49)	1	7.43	1	24.8	1	6.98	1	13.5	1	11.2	1		
	Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	0.254(RPD=0.39)	1	0.404	1	0.296	1	0.217	1	0.280	1	0.306	1		
	Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.006(RPD=0.00)	1	0.008	1	BQL(0.003)	1	0.008	1	0.007	1	0.007	1		
	Sodium (Na)	7440-23-5	mg/L	0.091	0.304	95.5(RPD=0.10)	1	145	1	103	1	79.0	1	76.7	1	83.8	1		
	Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1		
	Lead (Pb)	7439-92-1	mg/L	0.003	0.010	ND(RPD=NA)	1	ND	1	0.012	1	BQL(0.004)	1	BQL(0.004)	1	BQL(0.003)	1		
	Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	BQL(0.008)(RPD=NA)	1	BQL(0.011)	1	BQL(0.011)	1	BQL(0.009)	1	BQL(0.010)	1	BQL(0.008)	1		
	Selenium (Se)	7782-49-2	mg/L	0.007	0.024	BQL(0.007)(RPD=NA)	1	BQL(0.013)	1	ND	1	BQL(0.018)	1	BQL(0.010)	1	ND	1		
	Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.396(RPD=0.00)	1	0.995	1	0.486	1	0.568	1	0.455	1	0.395	1		
	Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1		
	Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	0.034(RPD=13.70)	1	0.046	1	0.027	1	0.037	1	0.043	1	0.039	1		
	Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND(RPD=NA)	1	ND	1	BQL(0.006)	1	ND	1	ND	1	ND	1		
	Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	BQL(0.030)(RPD=NA)	1	BQL(0.048)	1	ND	1	BQL(0.026)	1	BQL(0.037)	1	BQL(0.031)	1		
	Silicon (Si)	7440-21-3	mg/L	0.047	0.157	20.2(RPD=0.00)	1	18.9	1	14.4	1	21.8	1	24.5	1	23.6	1		
	Sulfur (S)	7704-34-9	mg/L	0.054	0.180	ND(RPD=NA)	1	ND	1	ND	1	11.5	1	12.2	1	ND	1		
	Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	0.738(RPD=0.27)	1	0.520	1	0.115	1	0.968	1	0.911	1	0.245	1		
	Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1		

Comments:

No problems noted. The MDL and QL'S represent those determined in June 2007, but not yet updated in RSKSOP-213(2)

- Notes:
- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
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Technical Directive:

4ME421HW

Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(2)

Analytes		Unit	ML6-7		ML7-2		ML7-4		ML7-5		ML7-6		ML7-7	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	ND	1	ND	1	ND	1	BQL(0.077)	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.008	0.027	0.032	1	0.034	1	0.030	1	BQL(0.022)	1	BQL(0.024)	1
Boron (B)	7440-42-8	mg/L	0.004	0.014	0.203	1	1.82	1	0.357	1	0.334	1	0.281	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.212	1	0.418	1	0.086	1	0.252	1	0.581	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	69.7	1	151	1	91.9	1	89.6	1	138	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.001)	1	0.051	1	0.005	1	0.005	1	BQL(0.003)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	0.005	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.008	0.027	12.9	1	442	1	43.1	1	45.5	1	25.7	1
Potassium (K)	7440-09-7	mg/L	0.092	0.307	2.28	1	6.29	1	1.66	1	1.62	1	2.33	1
Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	7.41	1	73.3	1	13.7	1	17.4	1	14.9	1
Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	0.416	1	0.900	1	0.469	1	0.414	1	0.764	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.008	1	ND	1	0.006	1	BQL(0.004)	1	0.006	1
Sodium (Na)	7440-23-5	mg/L	0.091	0.304	128	1	253	1	81.6	1	75.0	1	127	1
Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.003	0.010	ND	1	0.041	1	BQL(0.004)	1	BQL(0.005)	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	BQL(0.010)	1	BQL(0.005)	1	BQL(0.010)	1	BQL(0.008)	1	BQL(0.010)	1
Selenium (Se)	7782-49-2	mg/L	0.007	0.024	BQL(0.013)	1	ND	1	ND	1	ND	1	ND	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	1.00	1	1.44	1	1.06	1	0.893	1	2.24	1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	0.049	1	ND	1	0.048	1	0.046	1	0.062	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1	0.023	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	BQL(0.044)	1	ND	1	BQL(0.049)	1	BQL(0.054)	1	0.080	1
Silicon (Si)	7440-21-3	mg/L	0.047	0.157	20.3	1	24.4	1	23.8	1	22.9	1	21.8	1
Sulfur (S)	7704-34-9	mg/L	0.054	0.180	ND	1	ND	1	ND	1	ND	1	ND	1
Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	0.290	1	0.345	1	0.102	1	0.766	1	0.250	1
Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted. The MDL and QL'S represent those determined in June 2007, but not yet updated in RSKSOP-213(2)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. "-" denotes that the information is not available or the analyte is not analyzed.

Analytical Report - Analytical Results

Laboratory: IRMS

Report Date: 11/29/07

Tech Dir: 4OA269HW

Date Analyzed: 11/11-28/2007

Method: RSKSOP-296

Analyst: Feng Lu

Field Sample ID	IRMS Tracking ID	Lab ID	1000 $\delta^2\text{H}_{\text{VSMOW}}$			1000 $\delta^{18}\text{O}_{\text{VSMOW}}$		
			Measured	Mean	Stdev	Measured	Mean	Stdev
PMW-3 (7/11/07)	4118-0019	4118-1	-23.02			-5.08		
	4118-0020	4118-1	-18.00			-3.49		
	4118-0021	4118-1	-19.06			-3.57		
	4118-0022	4118-1	-18.28			-3.35		
	4118-0023	4118-1	-16.79			-3.34		
	4118-0024	4118-1	-17.01			-3.36		
	4118-0025	4118-1	-16.90			-3.12		
	4118-0033	4118-1	-16.79			-3.12		
	4118-0034	4118-1	-17.18	-16.98	0.27	-3.34	-3.23	0.15
PMW-5 (7/12/07)	4118-0035	4118-2	-18.34			-3.39		
	4118-0036	4118-2	-16.86			-3.14		
	4118-0037	4118-2	-16.82			-3.49		
	4118-0038	4118-2	-15.98	-16.40	0.59	-3.44	-3.47	0.04
ML2-4 (7/13/07)	4118-0030	4118-3	-17.23			-3.63		
	4118-0031	4118-3	-19.60			-3.18		
	4118-0032	4118-3	-16.58			-3.42		
	4118-0039	4118-3	-16.64			-3.36		
	4118-0040	4118-3	-16.96			-3.47		
	4118-0041	4118-3	-16.19			-3.19		
	4118-0042	4118-3	-17.43	-16.81	0.88	-3.31	-3.25	0.09
ML2-5 (7/13/07)	4118-0043	4118-4	-18.78			-3.25		
	4118-0044	4118-4	-16.32			-3.30		
	4118-0045	4118-4	-16.43			-3.19		
	4118-0046	4118-4	-17.18	-16.81	0.53	-3.07	-3.13	0.08
ML5-4 (7/16/07)	4118-0047	4118-5	-15.46			-3.37		
	4118-0048	4118-5	-16.66			-3.27		
	4118-0049	4118-5	-16.76			-3.24		
	4118-0050	4118-5	-16.89	-16.82	0.09	-3.19	-3.21	0.04
ML5-5 (7/16/07)	4118-0051	4118-6	-16.34			-3.27		
	4118-0052	4118-6	-17.36			-2.99		
	4118-0053	4118-6	-17.45			-3.24		
	4118-0054	4118-6	-16.68	-17.06	0.55	-3.36	-3.30	0.09
Duplicate1 (7/11/07)	4118-0055	4118-7	-17.42			-3.16		
	4118-0056	4118-7	-17.20			-3.44		
	4118-0057	4118-7	-16.40			-3.17		
	4118-0058	4118-7	-17.68	-17.04	0.91	-3.22	-3.19	0.03

Analyst: Feng Lu

			1000 $\delta^2\text{H}_{\text{VSMOW}}$			1000 $\delta^{18}\text{O}_{\text{VSMOW}}$		
Field Sample ID	IRMS Tracking ID	Lab ID	Measured	Mean	Stdev	Measured	Mean	Stdev
Comments: Due to memory effect, typically the first two to seven replicates (<i>italic</i>) of each sample were excluded from the calculations for the average (mean) and the standard deviation (stdev).								

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

02/01/08

Technical Directive:

4GP148HW

Analyst:

Kristie Hargrove

Method:

RSKSOP-265 Rev. 3

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)		Total Organic Carbon (TOC)	
				7440-44-0-TIC		7440-44-0-TOC		7440-44-0-TOC	
				RSKSOP-265 Rev. 3		RSKSOP-265 Rev. 3		RSKSOP-265 Rev. 3	
				mg/L		mg/L		mg/L	
				MDL		MDL		MDL	
				QL		QL		QL	
				0.024**		0.040**		0.322**	
				0.500**		0.500**		20.0**	
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF
PMW-1	4217-1	1/16/2008	1/24-1/31/2008	53.0 (± 0.0051)	8	91.7 (± 0.2054)	8	-	-
PMW-2	4217-2	1/16/2008	1/24-1/31/2008	80.0 (± 0.0514)	4	23.7 (± 0.0583)	4	-	-
DUPLICATE 1	4217-3	1/16/2008	1/24-1/31/2008	48.3 (± 0.0458)	4	-	-	158 (± 2.1204)	4
PMW-3	4217-4	1/16/2008	1/24-1/31/2008	63.4 (± 0.0968)	4	-	-	158 (± 1.4114)	4
PMW-4	4217-5	1/17/2008	1/24-1/31/2008	33.9 (± 0.0244)	4	29.4 (± 0.1877)	4	-	-
PMW-5	4217-6	1/17/2008	1/24-1/31/2008	67.9 (± 0.1405)	4	-	-	333 (± 0.9346)	8
PMW-5	4217-6 LAB DUP	1/17/2008	1/24-1/31/2008	-	-	-	-	338 (± 1.7715)(RPD=1.49)	8
PMW-6	4217-7	1/17/2008	1/24-1/31/2008	69.7 (± 0.1371)	4	22.7 (± 0.0591)	4	-	-
DUPLICATE 2	4217-8	1/17/2008	1/24-1/31/2008	44.2 (± 0.0819)	4	18.4 (± 0.0610)	4	-	-
ML 1-2	4217-9	1/17/2008	1/24-1/31/2008	91.3 (± 0.0714)	8	42.8 (± 0.1481)	4	-	-
ML 1-2	4217-9 LAB DUP	1/17/2008	1/24-1/31/2008	-	-	41.6 (± 0.1579)(RPD=2.84)	4	-	-
ML 1-3	4217-10	1/18/2008	1/24-1/31/2008	82.0 (± 0.0396)	8	45.1 (± 0.2261)	4	-	-
ML 1-3	4217-10 LAB DUP	1/18/2008	1/24-1/31/2008	80.4(± 0.0544)(RPD=1.97)	8	43.1 (± 0.3483)(RPD=4.54)	4	-	-
ML 1-4	4217-11	1/18/2008	1/24-1/31/2008	80.6 (± 0.0294)	8	27.6 (± 0.0436)	4	-	-
ML 1-5	4217-12	1/18/2008	1/24-1/31/2008	84.5 (± 0.0598)	8	24.5 (± 0.0375)	4	-	-
ML 1-7	4217-13	1/18/2008	1/24-1/31/2008	81.6 (± 0.0484)	8	13.6 (± 0.0524)	4	-	-
ML 2-3	4217-14	1/18/2008	1/24-1/31/2008	9.52 (± 0.0269)	8	-	-	873 (± 1.7032)	20
ML 2-4	4217-15	1/20/2008	1/24-1/31/2008	69.8 (± 0.0012)	8	-	-	174 (± 1.2443)	8
ML 2-5	4217-16	1/20/2008	1/24-1/31/2008	55.0 (± 0.0426)	8	14.3 (± 0.0756)	4	-	-
ML 2-6	4217-17	1/20/2008	1/24-1/31/2008	71.4 (± 0.0479)	8	13.1 (± 0.0217)	4	-	-
ML 2-7	4217-18	1/20/2008	1/24-1/31/2008	83.8 (± 0.0347)	8	14.9 (± 0.0278)	4	-	-
FIELD BLANK	4217-19	1/20/2008	1/24-1/31/2008	BQL (0.317) (± 0.0039)	1	BQL (0.238)(± 0.0670)	1	-	-
ML 3-3	4217-20	1/20/2008	1/24-1/31/2008	22.9 (± 0.0429)	4	-	-	1880 (± 1.1175)	20
ML 3-3	4217-20 LAB DUP	1/20/2008	1/24-1/31/2008	22.5 (± 0.0444)(RPD=1.76)	4	-	-	-	-
ML3-4	4217-21	1/21/2008	1/24-1/31/2008	45.8 (± 0.0991)	4	-	-	794 (± 1.0537)	10
ML3-5	4217-22	1/21/2008	1/24-1/31/2008	158 (± 0.1127)	8	-	-	511 (± 1.0958)	20
ML 3-7	4217-23	1/21/2008	1/24-1/31/2008	91.2 (± 0.0506)	8	8.07 (± 0.0141)	4	-	-
ML 4-2	4217-24	1/21/2008	1/24-1/31/2008	58.7 (± 0.0527)	8	-	-	747 (± 1.4612)	10
ML 4-3	4217-25	1/22/2008	1/24-1/31/2008	84.1 (± 0.0523)	8	-	-	94.2 (± 0.7355)	4
ML 4-5	4217-26	1/22/2008	1/24-1/31/2008	73.1 (± 0.0388)	8	13.1 (± 0.0133)	8	-	-
ML 4-6	4217-27	1/22/2008	1/24-1/31/2008	80.8 (± 0.0376)	8	12.9 (± 0.0292)	8	-	-
ML 4-7	4217-28	1/22/2008	1/24-1/31/2008	88.9 (± 0.0545)	8	17.2 (± 0.0082)	8	-	-
ML 4-7	4217-28 LAB DUP	1/22/2008	1/24-1/31/2008	89.5 (± 0.0490)(RPD=0.673)	8	17.2 (± 0.0097)(RPD=0)	8	-	-

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **General Parameters**

Report Date: **02/01/08**

Technical Directive: **4GP148HW**

Analyst: **Kristie Hargrove**

Method: **RSKSOP-265 Rev. 3**

Analyst:	Kristie Hargrove		Analyses	Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)		Total Organic Carbon (TOC)	
			Codes	7440-44-0-TIC		7440-44-0-TOC		7440-44-0-TOC	
			Methods	RSKSOP-265 Rev. 3		RSKSOP-265 Rev. 3		RSKSOP-265 Rev. 3	
			Unit	mg/L		mg/L		mg/L	
			MDL	0.024**		0.040**		0.322**	
			QL	0.500**		0.500**		20.0**	
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF
ML5-2	4221-1	1/22/2008	1/24-1/31/2008	65.5 (± 0.0962)	8	-	-	238 (± 0.9619)	8
ML5-3	4221-2	1/22/2008	1/24-1/31/2008	80.0 (± 0.0592)	8	-	-	88.9 (± 1.5108)	4
DUPLICATE 3	4221-3	1/22/2008	1/24-1/31/2008	80.9 (± 0.0545)	8	-	-	94.2 (± 0.9304)	4
ML 5-5	4221-4	1/22/2008	1/24-1/31/2008	38.2 (± 0.0119)	8	-	-	188 (± 1.0941)	8
ML5-6	4221-5	1/23/2008	1/24-1/31/2008	51.4 (± 0.0108)	8	-	-	158 (± 0.7326)	4
ML 5-7	4221-6	1/23/2008	1/24-1/31/2008	86.3 (± 0.0305)	8	67.8 (± 0.1589)	4	-	-
ML 6-3	4221-7	1/23/2008	1/24-1/31/2008	107 (± 0.0926)	8	84.5 (± 0.0451)	8	-	-
ML 6-4	4221-8	1/23/2008	1/24-1/31/2008	54.8 (± 0.1478)	8	56.9 (± 0.0465)	4	-	-
DUPLICATE 4	4221-9	1/23/2008	1/24-1/31/2008	55.9 (± 0.0396)	8	56.2 (± 0.0642)	4	-	-
ML 6-5	4221-10	1/23/2008	1/24-1/31/2008	31.7 (± 0.0691)	8	-	-	173 (± 0.7407)	8
ML6-5	4221-10 LAB DUP	1/23/2008	1/24-1/31/2008	31.5 (± 0.0409) (RPD=0.633)	8	-	-	170 (± 0.6121) (RPD=1.75)	8
ML 6-6	4221-11	1/23/2008	1/24-1/31/2008	39.0 (± 0.0155)	8	-	-	115 (± 0.2192)	4
ML 6-7	4221-12	1/23/2008	1/24-1/31/2008	72.7 (± 0.0307)	8	41.3 (± 0.1108)	4	-	-
ML 6-7	4221-12 LAB DUP	1/23/2008	1/24-1/31/2008	-	-	41.6 (± 0.1693)(RPD=0.724)	4	-	-
ML 7-3	4221-13	1/23/2008	1/24-1/31/2008	36.8 (± 0.0224)	8	-	-	1080 (± 0.9574)	20
ML 7-4	4221-14	1/23/2008	1/24-1/31/2008	34.1 (± 0.0563)	8	-	-	265 (± 0.8094)	8
ML 7-5	4221-15	1/24/2008	1/24-1/31/2008	16.2 (± 0.0045)	8	-	-	366 (± 0.6444)	4
ML 7-6	4221-16	1/24/2008	1/24-1/31/2008	42.3 (± 0.0066)	8	-	-	332 (± 0.4451)	8
ML7-7	4221-17	1/24/2008	1/24-1/31/2008	43.3 (± 0.0204)	8	-	-	273 (± 0.3738)	4
ML7-7	4221-17 LAB DUP	1/24/2008	1/24-1/31/2008	43.6 (± 0.0326) (RPD=0.690)	8	-	-	272 (± 3.6079) (RPD=0.367)	4

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set. The data values are reported with the dilution factors applied. Due to the wide range of TOC concentrations in the sample sets, the TOC samples were analyzed at a mid-calibration range and at a low-calibration range as is described in RSKSOP-265/3.

Notes:

** The MDL and QL should be raised by the same factor as the dilution factor in the samples that were diluted. New MDL studies have been performed for the Phoenix 8000. The new MDL values are 0.024 for TIC range 0.1-20 mg/L performed on 11-19-07, 0.040 for TOC range 0.1-20 mg/L performed on 11-16-07, and 0.322 for TOC range 20-200 mg/L performed on 7-31-07.

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (**DF**), if applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

01/31/08

Technical Directive:

4GP148HW

Analyst:

Lynda Callaway

Analytes	Chloride (Cl)	Bromide (Br)	Sulfate (as SO ₄)	Fluoride (F)
Codes	16887-00-6	7726-95-6-BR	14808-79-8	7782-41-4
Methods	RSKSOP-288/1	RSKSOP-288/1	RSKSOP-288/1	RSKSOP-288/1
Unit	mg/L	mg/L	mg/L	mg/L
MDL	* 0.079	0.341	* 0.049	0.024
QL	* 1.00	1.00	* 1.00	0.200

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF	Data	DF	Data	DF
PMW-1	4217-1	1/16/2008	1/24 - 1/30/08	75.0	6	BQL (0.468)	1	9.33	1	ND	1
PMW-2	4217-2	1/16/2008	1/24 - 1/30/08	43.9	1	BQL (0.728)	1	37.2	1	ND	1
Duplicate-1	4217-3	1/16/2008	1/24 - 1/30/08	116	6	1.20	1	1.33	1	ND	1
PMW-3	4217-4	1/16/2008	1/24 - 1/30/08	122	6	1.17	1	1.31	1	ND	1
PMW-4	4217-5	1/17/2008	1/24 - 1/30/08	57.3	6	1.14	1	37.2	6	ND	1
PMW-5	4217-6	1/17/2008	1/24 - 1/30/08	260	21	BQL (0.824)	1	BQL (0.907)	1	ND	1
PMW-6	4217-7	1/17/2008	1/24 - 1/30/08	46.8	1	1.14	1	24.7	1	ND	1
Duplicate-2	4217-8	1/17/2008	1/24 - 1/30/08	48.8	1	1.03	1	25.2	1	BQL (0.025)	1
ML1-2	4217-9	1/17/2008	1/24 - 1/30/08	144	6	1.18	1	74.7	6	ND	1
ML1-3	4217-10	1/18/2008	1/24 - 1/30/08	79.3	6	BQL (0.995)	1	24.1	1	0.315	1
ML1-3	4217-10 Lab dup	1/18/2008	1/24 - 1/30/08	76.9 (RPD=3.07)	6	1.04 (RPD=N/A)	1	23.6 (RPD=2.10)	1	0.294 (RPD=6.90)	1
ML1-4	4217-11	1/18/2008	1/24 - 1/30/08	44.0	6	1.17	1	33.3	1	BQL (0.063)	1
ML1-5	4217-12	1/18/2008	1/24 - 1/30/08	43.3	1	BQL (0.893)	1	29.6	1	BQL (0.121)	1
ML1-7	4217-13	1/18/2008	1/24 - 1/30/08	83.4	6	BQL (0.992)	1	22.7	1	0.339	1
ML2-3	4217-14	1/18/2008	1/24 - 1/30/08	652	51	ND	1	BQL (0.267)	1	ND	1
ML2-4	4217-15	1/20/2008	1/24 - 1/30/08	215	6	1.01	1	1.82	1	ND	1
ML2-5	4217-16	1/20/2008	1/24 - 1/30/08	32.8	1	1.14	1	29.8	1	BQL (0.106)	1
ML2-6	4217-17	1/20/2008	1/24 - 1/30/08	49.2	1	1.16	1	33.4	1	BQL (0.090)	1
ML2-7	4217-18	1/20/2008	1/24 - 1/30/08	86.1	6	1.23	1	37.9	1	0.283	1
ML2-7	4217-18 Lab dup	1/20/2008	1/24 - 1/30/08	86.3 (RPD=0.232)	6	1.15 (RPD=6.72)	1	37.6 (RPD=0.795)	1	0.272 (RPD=3.96)	1
Field Blank	4217-19	1/20/2008	1/24 - 1/30/08	ND	1	ND	1	ND	1	ND	1
ML3-3	4217-20	1/20/2008	1/24 - 1/30/08	96.7	11	BQL (0.857)	1	BQL (0.839)	1	ND	1
ML3-4	4217-21	1/21/2008	1/24 - 1/30/08	31.3	1	1.32	1	BQL (0.297)	1	BQL (0.134)	1
ML3-5	4217-22	1/21/2008	1/24 - 1/30/08	37.8	1	1.88	1	BQL (0.087)	1	BQL (0.041)	1
ML 3-7	4217-23	1/21/2008	1/24 - 1/30/08	113	6	BQL (0.822)	1	ND	1	ND	1
ML4-2	4217-24	1/21/2008	1/24 - 1/30/08	364	11	BQL (0.808)	1	BQL (0.131)	1	ND	1
ML4-3	4217-25	1/22/2008	1/24 - 1/30/08	155	11	BQL (0.693)	1	BQL (0.268)	1	0.275	1
ML4-5	4217-26	1/22/2008	1/24 - 1/30/08	45.5	6	BQL (0.604)	1	10.3	1	0.226	1
ML4-6	4217-27	1/22/2008	1/24 - 1/30/08	54.8	6	BQL (0.555)	1	5.17	1	0.319	1
ML4-7	4217-28	1/22/2008	1/24 - 1/30/08	68.5	6	BQL (0.591)	1	2.53	1	0.281	1
ML4-7	4217-28 Lab dup	1/22/2008	1/24 - 1/30/08	69.9 (RPD=2.02)	6	BQL (0.564) (RPD=NA)	1	2.59 (RPD=2.34)	1	0.292 (RPD=3.84)	1
ML5-2	4221-1	1/22/2008	1/29 & 1/30/08	394	11	BQL (0.768)	1	BQL (0.084)	1	ND	1
ML5-3	4221-2	1/22/2008	1/29 & 1/30/08	237	6	ND	1	BQL (0.117)	1	0.293	1
Duplicate-3	4221-3	1/22/2008	1/29 & 1/30/08	229	6	ND	1	BQL (0.137)	1	0.286	1
ML5-5	4221-4	1/22/2008	1/29 & 1/30/08	87.4	6	BQL (0.585)	1	ND	1	BQL (0.068)	1

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:

General Parameters

Report Date:

01/31/08

Technical Directive:

4GP148HW

Analyst:

Lynda Callaway

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Chloride (Cl)		Bromide (Br)		Sulfate (as SO ₄)		Fluoride (F)	
				Codes	16887-00-6	7726-95-6-BR		14808-79-8		7782-41-4	
				Methods	RSKSOP-288/1	RSKSOP-288/1		RSKSOP-288/1		RSKSOP-288/1	
				Unit	mg/L	mg/L		mg/L		mg/L	
				MDL	* 0.079	0.341		* 0.049		0.024	
				QL	* 1.00	1.00		* 1.00		0.200	
Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
ML5-6	4221-5	1/23/2008	1/29 & 1/30/08	110	6	BQL (0.712)	1	ND	1	BQL (0.096)	1
ML5-7	4221-6	1/23/2008	1/29 & 1/30/08	126	6	BQL (0.542)	1	ND	1	0.353	1
ML6-3	4221-7	1/23/2008	1/29 & 1/30/08	226	6	BQL (0.386)	1	ND	1	0.332	1
ML6-4	4221-8	1/23/2008	1/29 & 1/30/08	115	6	BQL (0.779)	1	ND	1	BQL (0.148)	1
Duplicate-4	4221-9	1/23/2008	1/29 & 1/30/08	117	6	BQL (0.838)	1	ND	1	BQL (0.144)	1
ML6-5	4221-10	1/23/2008	1/29 & 1/30/08	252	6	BQL (0.725)	1	ND	1	ND	1
ML6-5	4221-10 Lab dup	1/23/2008	1/29 & 1/30/08	249 (RPD=1.20)	6	BQL (0.627) (RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
ML6-6	4221-11	1/23/2008	1/29 & 1/30/08	205	6	BQL (0.550)	1	ND	1	BQL (0.047)	1
ML6-7	4221-12	1/23/2008	1/29 & 1/30/08	166	6	BQL (0.836)	1	ND	1	0.320	1
ML7-3	4221-13	1/23/2008	1/29 & 1/30/08	228	6	BQL (0.616)	1	BQL (0.222)	1	BQL (0.036)	1
ML7-4	4221-14	1/23/2008	1/29 & 1/30/08	99.7	6	BQL (0.979)	1	ND	1	BQL (0.031)	1
ML7-5	4221-15	1/24/2008	1/29 & 1/30/08	149	6	BQL (0.755)	1	ND	1	ND	1
ML7-6	4221-16	1/24/2008	1/29 & 1/30/08	154	6	BQL (0.757)	1	ND	1	BQL (0.109)	1
ML7-7	4221-17	1/24/2008	1/29 & 1/30/08	144	6	BQL (0.861)	1	ND	1	0.226	1
ML7-7	4221-17 Lab dup	1/24/2008	1/29 & 1/30/08	142 (RPD=1.40)	6	BQL (0.804) (RPD=NA)	1	ND (RPD=NA)	1	0.229 (RPD=1.32)	1

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set within the calibration range. *MDL and QL should be raised by the same factor as the dilution factor for those samples that were diluted. The MDLs were determined on 7/13/07 & 7/24/07.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all; NA means not applicable; NSF means not sufficient amount for analyses. All the results are corrected with dilution factors (DF), if applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals

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Technical Directive: 4ME471HW

Sample Results (1, 2)

Analysts:	Sandra Saye		Field Sample ID		PMW-1		PMW-1		PMW-2		DUPLICATE-1		PMW-3		PMW-4			
	Method: RSKSOP 213(3)				Sample Lab ID		4217-01		4217-01 Lab Dup		4217-02		4217-03		4217-04		4217-05	
					Date Collected		1/16/08		1/16/08		1/16/08		1/16/08		1/16/08		1/17/08	
					Date Analyzed		1/31/08		1/31/08		1/31/08		1/31/08		1/31/08		1/31/08	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF		
Names	Codes																	
Silver (Ag)		7440-22-4	mg/L	0.004	0.014	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Aluminum (Al)		7429-90-5	mg/L	0.030	0.100	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Arsenic (As)		7440-38-2	mg/L	0.008	0.027	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Boron (B)		7440-42-8	mg/L	0.004	0.014	0.091	1	0.094(RPD=3.24)	1	0.155	1	0.184	1	0.184	1	0.140	1	
Barium (Ba)		7440-39-3	mg/L	0.001	0.004	0.065	1	0.066(RPD=1.53)	1	0.029	1	0.053	1	0.051	1	0.092	1	
Beryllium (Be)		7440-41-7	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Calcium (Ca)		7440-70-2	mg/L	0.028	0.094	58.3	1	58.7(RPD=0.68)	1	45.2	1	48.0	1	46.9	1	16.7	1	
Cadmium (Cd)		7440-43-9	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Cobalt (Co)		7440-48-4	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Chromium (Cr)		7440-47-3	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Copper (Cu)		7440-50-8	mg/L	0.003	0.010	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Iron (Fe)		7439-89-6	mg/L	0.008	0.027	75.0	1	74.8(RPD=0.27)	1	13.2	1	20.4	1	19.9	1	36.5	1	
Potassium (K)		7440-09-7	mg/L	0.092	0.307	2.27	1	2.27(RPD=0.00)	1	2.06	1	3.11	1	3.02	1	1.47	1	
Magnesium (Mg)		7439-95-4	mg/L	0.023	0.077	9.62	1	9.61(RPD=0.10)	1	10.1	1	14.5	1	14.2	1	9.54	1	
Manganese (Mn)		7439-96-5	mg/L	0.002	0.007	0.310	1	0.310(RPD=0.00)	1	0.127	1	0.191	1	0.186	1	0.064	1	
Molybdenum (Mo)		7439-98-7	mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.003)(RPD=NA)	1	0.006	1	BQL(0.004)	1	BQL(0.003)	1	BQL(0.001)	1	
Sodium (Na)		7440-23-5	mg/L	0.091	0.304	46.4	1	46.7(RPD=0.64)	1	56.1	1	68.7	1	67.6	1	57.1	1	
Nickel (Ni)		7440-02-0	mg/L	0.006	0.020	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Lead (Pb)		7439-92-1	mg/L	0.003	0.010	0.013	1	0.012(RPD=8.00)	1	ND	1	BQL(0.005)	1	BQL(0.005)	1	BQL(0.005)	1	
Antimony (Sb)		7440-36-0	mg/L	0.004	0.014	BQL(0.011)	1	BQL(0.011)(RPD=NA)	1	BQL(0.008)	1	BQL(0.010)	1	BQL(0.007)	1	BQL(0.005)	1	
Selenium (Se)		7782-49-2	mg/L	0.007	0.024	BQL(0.011)	1	BQL(0.014)(RPD=NA)	1	BQL(0.014)	1	BQL(0.011)	1	ND	1	BQL(0.012)	1	
Strontium (Sr)		7440-24-6	mg/L	0.001	0.004	0.264	1	0.266(RPD=0.75)	1	0.162	1	0.265	1	0.257	1	0.111	1	
Titanium (Ti)		7440-32-6	mg/L	0.002	0.007	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Thallium (Tl)		7440-28-0	mg/L	0.005	0.017	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Vanadium (V)		7440-62-2	mg/L	0.004	0.014	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Zinc (Zn)		7440-66-6	mg/L	0.016	0.054	BQL(0.022)	1	BQL(0.024)(RPD=NA)	1	BQL(0.020)	1	BQL(0.020)	1	BQL(0.022)	1	ND	1	
Silicon (Si)		7440-21-3	mg/L	0.047	0.157	9.35	1	9.34(RPD=0.11)	1	15.5	1	18.7	1	18.8	1	13.6	1	
Sulfur (S)		7704-34-9	mg/L	0.054	0.180	3.41	1	3.40(RPD=0.29)	1	12.5	1	25.6	1	17.6	1	17.1	1	
Phosphorus(P)		7723-14-0	mg/L	0.012	0.040	0.445	1	0.451(RPD=1.34)	1	0.980	1	1.09	1	1.09	1	0.607	1	
Uranium (U)		7440-61-1	mg/L	0.006	0.020	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	

Comments:

No problems noted.

- Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 2/4/08

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Technical Directive: 4ME471HW

Sample Results (1, 2)

Analysts: Sandra Saye

Method: RKSOP 213(3)

Analysts:	Sandra Saye		Field Sample ID		PMW-5		PMW-6		DUPLICATE-2		ML1-2		ML1-2		ML1-3			
	RSKSOP 213(3)				Sample Lab ID		4217-06		4217-07		4217-08		4217-09		4217-09 Lab Dup		4217-10	
					Date Collected		1/17/08		1/17/08		1/17/08		1/17/08		1/17/08		1/18/08	
					Date Analyzed		1/31/08		1/31/08		1/31/08		1/31/08		1/31/08		1/31/08	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF		
Names	Codes																	
	Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	
	Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	
	Arsenic (As)	7440-38-2	mg/L	0.008	0.027	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	
	Boron (B)	7440-42-8	mg/L	0.004	0.014	0.175	1	0.144	1	0.144	1	0.097	1	0.103(RPD=6.00)	1	0.140	1	
	Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.153	1	0.050	1	0.049	1	0.229	1	0.226(RPD=1.32)	1	0.171	1	
	Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	
	Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	101	1	34.9	1	34.2	1	87.7	1	86.5(RPD=1.38)	1	58.4	1	
	Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND	1	BQL(0.001)	1	ND(RPD=NA)	1	ND	1	
	Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	
	Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	
	Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	
	Iron (Fe)	7439-89-6	mg/L	0.008	0.027	150	1	23.3	1	22.6	1	62.7	1	62.3(RPD=0.64)	1	28.0	1	
	Potassium (K)	7440-09-7	mg/L	0.092	0.307	9.38	1	2.23	1	2.14	1	4.41	1	4.36(RPD=1.14)	1	2.27	1	
	Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	19.9	1	7.12	1	7.00	1	15.5	1	15.3(RPD=1.30)	1	15.8	1	
	Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	0.546	1	0.184	1	0.178	1	0.645	1	0.645(RPD=0.00)	1	0.264	1	
	Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.004)	1	BQL(0.004)	1	BQL(0.004)	1	BQL(0.004)(RPD=NA)	1	BQL(0.003)	1	
	Sodium (Na)	7440-23-5	mg/L	0.091	0.304	71.4	1	61.4	1	61.1	1	103	1	102(RPD=0.98)	1	106	1	
	Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	
	Lead (Pb)	7439-92-1	mg/L	0.003	0.010	0.026	1	BQL(0.005)	1	BQL(0.005)	1	0.012	1	0.011(RPD=8.70)	1	BQL(0.004)	1	
	Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	BQL(0.013)	1	BQL(0.008)	1	BQL(0.008)	1	0.015	1	0.015(RPD=0.00)	1	BQL(0.010)	1	
	Selenium (Se)	7782-49-2	mg/L	0.007	0.024	BQL(0.016)	1	BQL(0.016)	1	BQL(0.014)	1	0.025	1	BQL(0.022)(RPD=NA)	1	BQL(0.023)	1	
	Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.559	1	0.163	1	0.158	1	0.548	1	0.540(RPD=1.47)	1	0.772	1	
	Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	
	Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	BQL(0.005)	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	
	Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	
	Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	BQL(0.038)	1	ND	1	BQL(0.017)	1	BQL(0.038)	1	BQL(0.036)(RPD=NA)	1	BQL(0.029)	1	
	Silicon (Si)	7440-21-3	mg/L	0.047	0.157	18.7	1	17.2	1	17.3	1	7.46	1	7.47(RPD=0.13)	1	11.0	1	
	Sulfur (S)	7704-34-9	mg/L	0.054	0.180	32.0	1	33.9	1	33.4	1	30.5	1	30.2(RPD=0.99)	1	9.73	1	
	Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	0.961	1	1.38	1	1.37	1	BQL(0.030)	1	BQL(0.028)(RPD=NA)	1	0.150	1	
	Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. * - * denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **2/4/08**

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Technical Directive: **4ME471HW**

Sample Results (1, 2)

Analysts: **Sandra Saye**

Method: **RSKSOP 213(3)**

Field Sample ID	ML1-4	ML1-5	ML1-7	ML2-3	ML2-4	ML2-5
Sample Lab ID	4217-11	4217-12	4217-13	4217-14	4217-15	4217-16
Date Collected	1/18/08	1/18/08	1/18/08	1/18/08	1/20/08	1/20/08
Date Analyzed	1/31/08	1/31/08	1/31/08	1/31/08	1/31/08	1/31/08

Analytes		Unit	MDL	QL	Data		DF	Data		DF	Data		DF	Data		DF	Data		DF
Names	Codes																		
Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND		1	ND		1	ND		1	BQL(0.004)		1	ND		1
Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	ND		1	ND		1	ND		1	ND		1	ND		1
Arsenic (As)	7440-38-2	mg/L	0.008	0.027	ND		1	ND		1	ND		1	ND		1	ND		1
Boron (B)	7440-42-8	mg/L	0.004	0.014	0.181		1	0.186		1	0.173		1	0.075		1	0.199		1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.106		1	0.094		1	0.070		1	1.20		1	0.485		1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND		1	ND		1	ND		1	ND		1	ND		1
Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	37.1		1	40.4		1	38.4		1	275		1	119		1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND		1	ND		1	ND		1	BQL(0.003)		1	ND		1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND		1	ND		1	ND		1	ND		1	ND		1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND		1	ND		1	ND		1	ND		1	ND		1
Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND		1	ND		1	ND		1	ND		1	ND		1
Iron (Fe)	7439-89-6	mg/L	0.008	0.027	8.54		1	6.92		1	3.99		1	293		1	23.3		1
Potassium (K)	7440-09-7	mg/L	0.092	0.307	1.44		1	1.51		1	1.49		1	2.43		1	1.86		1
Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	8.55		1	5.38		1	4.14		1	104		1	21.7		1
Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	0.175		1	0.207		1	0.189		1	1.49		1	0.538		1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)		1	BQL(0.002)		1	0.005		1	ND		1	BQL(0.003)		1
Sodium (Na)	7440-23-5	mg/L	0.091	0.304	91.3		1	99.9		1	142		1	187		1	112		1
Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND		1	ND		1	ND		1	ND		1	ND		1
Lead (Pb)	7439-92-1	mg/L	0.003	0.010	ND		1	ND		1	ND		1	0.044		1	BQL(0.004)		1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	BQL(0.004)		1	BQL(0.012)		1	BQL(0.009)		1	0.017		1	BQL(0.011)		1
Selenium (Se)	7782-49-2	mg/L	0.007	0.024	BQL(0.015)		1	BQL(0.017)		1	BQL(0.014)		1	BQL(0.023)		1	0.024		1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.496		1	0.626		1	0.462		1	4.10		1	1.52		1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND		1	ND		1	ND		1	ND		1	ND		1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND		1	ND		1	ND		1	BQL(0.009)		1	ND		1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND		1	ND		1	ND		1	ND		1	ND		1
Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	BQL(0.021)		1	BQL(0.020)		1	BQL(0.016)		1	0.070		1	BQL(0.050)		1
Silicon (Si)	7440-21-3	mg/L	0.047	0.157	16.5		1	17.0		1	19.0		1	9.72		1	23.2		1
Sulfur (S)	7704-34-9	mg/L	0.054	0.180	12.4		1	11.7		1	8.71		1	1.46		1	1.47		1
Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	0.973		1	0.930		1	1.10		1	0.284		1	0.353		1
Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND		1	ND		1	ND		1	BQL(0.007)		1	ND		1

Comments:

No problems noted.

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. " - " denotes that the information is not available or the analyte is not analyzed.

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Analytical Service Results Report

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Technical Directive:4ME471HW

Sample Results (1, 2)

Analysts:	Sandra Saye		Field Sample ID		ML2-6		ML2-7		ML2-7		Field Blank		ML3-3		ML3-4			
	RSKSOP 213(3)		Sample Lab ID		4217-17		4217-18		4217-18 Lab Dup		4217-19		4217-20		4217-21			
			Date Collected		1/20/08		1/20/08		1/20/08		1/20/08		1/20/08		1/21/08			
			Date Analyzed		1/31/08		1/31/08		1/31/08		1/31/08		1/31/08		1/31/08			
Method:																		
Analytes				Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names		Codes																
Silver (Ag)		7440-22-4		mg/L	0.004	0.014	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Aluminum (Al)		7429-90-5		mg/L	0.030	0.100	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Arsenic (As)		7440-38-2		mg/L	0.008	0.027	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Boron (B)		7440-42-8		mg/L	0.004	0.014	0.169	1	0.172	1	0.172(RPD=0.00)	1	ND	1	ND	1	0.050	1
Barium (Ba)		7440-39-3		mg/L	0.001	0.004	0.027	1	0.039	1	0.038(RPD=2.60)	1	0.111	1	1.05	1	0.276	1
Beryllium (Be)		7440-41-7		mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Calcium (Ca)		7440-70-2		mg/L	0.028	0.094	43.8	1	53.2	1	52.5(RPD=1.32)	1	ND	1	295	1	128	1
Cadmium (Cd)		7440-43-9		mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	0.008	1	ND	1
Cobalt (Co)		7440-48-4		mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Chromium (Cr)		7440-47-3		mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Copper (Cu)		7440-50-8		mg/L	0.003	0.010	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Iron (Fe)		7439-89-6		mg/L	0.008	0.027	3.73	1	2.55	1	2.54(RPD=0.39)	1	ND	1	627	1	200	1
Potassium (K)		7440-09-7		mg/L	0.092	0.307	1.29	1	1.59	1	1.62(RPD=1.87)	1	ND	1	8.42	1	32.4	1
Magnesium (Mg)		7439-95-4		mg/L	0.023	0.077	5.72	1	4.62	1	4.60(RPD=0.43)	1	ND	1	122	1	18.4	1
Manganese (Mn)		7439-96-5		mg/L	0.002	0.007	0.163	1	0.266	1	0.265(5RPD=0.38)	1	ND	1	0.916	1	0.353	1
Molybdenum (Mo)		7439-98-7		mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.004)	1	BQL(0.004)(RPD=NA)	1	ND	1	ND	1	BQL(0.002)	1
Sodium (Na)		7440-23-5		mg/L	0.091	0.304	74.1	1	104	1	103(RPD=0.97)	1	ND	1	189	1	87.7	1
Nickel (Ni)		7440-02-0		mg/L	0.006	0.020	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Lead (Pb)		7439-92-1		mg/L	0.003	0.010	ND	1	ND	1	ND(RPD=NA)	1	ND	1	0.097	1	0.031	1
Antimony (Sb)		7440-36-0		mg/L	0.004	0.014	BQL(0.009)	1	BQL(0.010)	1	BQL(0.006)(RPD=NA)	1	ND	1	0.022	1	BQL(0.012)	1
Selenium (Se)		7782-49-2		mg/L	0.007	0.024	BQL(0.010)	1	BQL(0.014)	1	BQL(0.013)(RPD=NA)	1	ND	1	ND	1	BQL(0.010)	1
Strontium (Sr)		7440-24-6		mg/L	0.001	0.004	0.505	1	0.825	1	0.812(RPD=1.59)	1	BQL(0.001)	1	3.79	1	1.66	1
Titanium (Ti)		7440-32-6		mg/L	0.002	0.007	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Thallium (Tl)		7440-28-0		mg/L	0.005	0.017	ND	1	ND	1	ND(RPD=NA)	1	ND	1	0.048	1	BQL(0.010)	1
Vanadium (V)		7440-62-2		mg/L	0.004	0.014	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Zinc (Zn)		7440-66-6		mg/L	0.016	0.054	BQL(0.021)	1	BQL(0.027)	1	BQL(0.025)(RPD=NA)	1	ND	1	BQL(0.052)	1	BQL(0.042)	1
Silicon (Si)		7440-21-3		mg/L	0.047	0.157	18.3	1	19.0	1	19.0(RPD=0.00)	1	BQL(0.120)	1	4.54	1	9.07	1
Sulfur (S)		7704-34-9		mg/L	0.054	0.180	11.6	1	12.7	1	12.6(RPD=0.79)	1	BQL(0.109)	1	ND	1	ND	1
Phosphorus(P)		7723-14-0		mg/L	0.012	0.040	1.21	1	0.435	1	0.435(RPD=0.00)	1	ND	1	0.257	1	0.499	1
Uranium (U)		7440-61-1		mg/L	0.006	0.020	ND	1	ND	1	ND(RPD=NA)	1	ND	1	BQL(0.019)	1	ND	1

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: **4ME471HW**

Sample Results (1, 2)

Analysts: **Sandra Saye**

Method: **RSKSOP 213(3)**

Field Sample ID	ML3-5	ML3-7	ML4-2	ML4-3	ML4-5	ML4-6
Sample Lab ID	4217-22	4217-23	4217-24	4217-25	4217-26	4217-27
Date Collected	1/21/08	1/21/08	1/21/08	1/22/08	1/22/08	1/22/08
Date Analyzed	1/31/08	1/31/08	1/31/08	1/31/08	1/31/08	1/31/08

Analytes		Unit	MDL	QL	Data		DF	Data		DF	Data		DF	Data		DF	Data		DF
Names	Codes																		
Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND		1	ND		1	ND		1	ND		1	ND		1
Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	ND		1	ND		1	ND		1	ND		1	ND		1
Arsenic (As)	7440-38-2	mg/L	0.008	0.027	ND		1	ND		1	ND		1	0.035		1	ND		1
Boron (B)	7440-42-8	mg/L	0.004	0.014	0.044		1	0.122		1	0.215		1	0.118		1	0.145		1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.492		1	0.069		1	0.966		1	0.253		1	0.096		1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND		1	ND		1	ND		1	ND		1	ND		1
Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	144		1	39.5		1	146		1	66.3		1	42.3		1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND		1	ND		1	ND		1	ND		1	ND		1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND		1	ND		1	ND		1	ND		1	ND		1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND		1	ND		1	ND		1	ND		1	ND		1
Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND		1	ND		1	ND		1	ND		1	ND		1
Iron (Fe)	7439-89-6	mg/L	0.008	0.027	184		1	25.9		1	338		1	68.9		1	8.68		1
Potassium (K)	7440-09-7	mg/L	0.092	0.307	39.3		1	1.67		1	9.93		1	0.984		1	1.33		1
Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	27.0		1	6.71		1	63.4		1	27.9		1	8.58		1
Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	0.857		1	0.298		1	0.909		1	0.294		1	0.180		1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.002)		1	BQL(0.002)		1	ND		1	BQL(0.003)		1	BQL(0.003)		1
Sodium (Na)	7440-23-5	mg/L	0.091	0.304	127		1	111		1	200		1	64.5		1	65.4		1
Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND		1	ND		1	ND		1	ND		1	ND		1
Lead (Pb)	7439-92-1	mg/L	0.003	0.010	0.030		1	BQL(0.005)		1	0.053		1	0.012		1	ND		1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	0.015		1	BQL(0.009)		1	0.018		1	BQL(0.012)		1	BQL(0.009)		1
Selenium (Se)	7782-49-2	mg/L	0.007	0.024	BQL(0.022)		1	BQL(0.012)		1	BQL(0.014)		1	BQL(0.019)		1	BQL(0.010)		1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	1.37		1	0.299		1	2.17		1	0.736		1	0.361		1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND		1	ND		1	ND		1	ND		1	ND		1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND		1	ND		1	0.020		1	ND		1	ND		1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND		1	ND		1	ND		1	ND		1	ND		1
Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	BQL(0.047)		1	BQL(0.020)		1	BQL(0.036)		1	BQL(0.025)		1	BQL(0.023)		1
Silicon (Si)	7440-21-3	mg/L	0.047	0.157	10.3		1	22.0		1	8.39		1	10.9		1	15.3		1
Sulfur (S)	7704-34-9	mg/L	0.054	0.180	ND		1	ND		1	ND		1	ND		1	3.25		1
Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	0.483		1	1.19		1	0.143		1	0.163		1	1.24		1
Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND		1	ND		1	ND		1	ND		1	ND		1

Comments:

No problems noted.

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
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Technical Directive:

4ME471HW

Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analytes		Unit	MDL	QL	Field Sample ID		ML4-7		ML5-2		ML5-3		DUPLICATE-3		ML5-5		ML5-6	
Names	Codes				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	ND	1	ND	1	ND	1	ND	1	ND	1	BQL(0.040)	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.008	0.027	ND	1	ND	1	ND	1	0.218	1	0.215	1	ND	1	ND	1
Boron (B)	7440-42-8	mg/L	0.004	0.014	0.151	1	0.103	1	0.082	1	0.085	1	0.159	1	0.165	1	0.165	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.232	1	0.293	1	0.220	1	0.219	1	0.175	1	0.169	1	0.169	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	59.7	1	70.0	1	63.1	1	62.6	1	69.1	1	65.8	1	65.8	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	BQL(0.001)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.008	0.027	7.85	1	191	1	113	1	113	1	20.4	1	23.7	1	23.7	1
Potassium (K)	7440-09-7	mg/L	0.092	0.307	1.36	1	2.77	1	1.34	1	1.32	1	2.99	1	2.24	1	2.24	1
Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	6.27	1	37.8	1	32.9	1	32.3	1	14.2	1	14.7	1	14.7	1
Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	0.346	1	0.322	1	0.218	1	0.218	1	0.334	1	0.338	1	0.338	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.003)	1	BQL(0.003)	1	0.005	1	0.005	1	BQL(0.002)	1	BQL(0.003)	1	BQL(0.003)	1
Sodium (Na)	7440-23-5	mg/L	0.091	0.304	86.7	1	167	1	117	1	115	1	63.7	1	89.4	1	89.4	1
Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.003	0.010	ND	1	0.030	1	0.018	1	0.017	1	BQL(0.004)	1	BQL(0.005)	1	BQL(0.005)	1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	BQL(0.011)	1	0.015	1	BQL(0.011)	1	BQL(0.014)	1	BQL(0.009)	1	BQL(0.011)	1	BQL(0.011)	1
Selenium (Se)	7782-49-2	mg/L	0.007	0.024	BQL(0.013)	1	ND	1	BQL(0.012)	1	0.026	1	ND	1	BQL(0.007)	1	BQL(0.007)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.633	1	0.715	1	0.675	1	0.671	1	0.685	1	0.596	1	0.596	1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	BQL(0.025)	1	BQL(0.024)	1	BQL(0.023)	1	BQL(0.023)	1	BQL(0.030)	1	BQL(0.031)	1	BQL(0.031)	1
Silicon (Si)	7440-21-3	mg/L	0.047	0.157	17.9	1	7.39	1	10.6	1	10.5	1	20.2	1	21.5	1	21.5	1
Sulfur (S)	7704-34-9	mg/L	0.054	0.180	0.885	1	1.71	1	0.884	1	0.932	1	1.31	1	0.214	1	0.214	1
Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	0.862	1	0.142	1	0.669	1	0.677	1	1.09	1	0.744	1	0.744	1
Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory:

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Technical Directive:

4ME471HW

Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Field Sample ID	ML5-6	ML5-7	ML6-3	ML6-4	DUPLICATE-4	ML6-5
Sample Lab ID	4221-05 Lab Dup	4221-06	4221-07	4221-08	4221-09	4221-10
Date Collected	1/23/08	1/23/08	1/23/08	1/23/08	1/23/08	1/23/08
Date Analyzed	2/4/08	2/4/08	2/4/08	2/4/08	2/4/08	2/4/08

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	ND(RPD=NA)	1	ND	1	ND	1	ND	1	BQL(0.034)	1	BQL(0.056)	1
Arsenic (As)	7440-38-2	mg/L	0.008	0.027	ND(RPD=NA)	1	ND	1	0.138	1	ND	1	ND	1	ND	1
Boron (B)	7440-42-8	mg/L	0.004	0.014	0.169(RPD=2.40)	1	0.162	1	0.137	1	0.180	1	0.174	1	0.152	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.170(RPD=0.59)	1	0.367	1	0.160	1	0.245	1	0.244	1	0.210	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	66.0(RPD=0.30)	1	80.9	1	82.8	1	56.7	1	56.7	1	96.8	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.008	0.027	23.7(RPD=0.00)	1	14.2	1	60.7	1	9.78	1	9.78	1	33.5	1
Potassium (K)	7440-09-7	mg/L	0.092	0.307	2.18(RPD=2.71)	1	1.79	1	1.46	1	2.77	1	2.80	1	3.51	1
Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	14.8(RPD=0.68)	1	8.60	1	28.8	1	8.87	1	8.83	1	21.0	1
Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	0.343(RPD=1.47)	1	0.436	1	0.356	1	0.269	1	0.261	1	0.404	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	BQL(0.003)(RPD=NA)	1	BQL(0.003)	1	0.004	1	BQL(0.004)	1	0.004	1	BQL(0.004)	1
Sodium (Na)	7440-23-5	mg/L	0.091	0.304	89.6(RPD=0.22)	1	114	1	127	1	65.1	1	65.7	1	75.8	1
Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.003	0.010	BQL(0.003)(RPD=NA)	1	ND	1	BQL(0.008)	1	ND	1	ND	1	BQL(0.007)	1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	BQL(0.010)(RPD=NA)	1	BQL(0.010)	1	BQL(0.013)	1	BQL(0.011)	1	BQL(0.009)	1	BQL(0.012)	1
Selenium (Se)	7782-49-2	mg/L	0.007	0.024	BQL(0.008)(RPD=NA)	1	BQL(0.017)	1	0.027	1	BQL(0.015)	1	BQL(0.017)	1	BQL(0.008)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.597(RPD=0.17)	1	1.07	1	1.11	1	0.728	1	0.724	1	0.652	1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	BQL(0.030)(RPD=NA)	1	BQL(0.035)	1	BQL(0.034)	1	BQL(0.028)	1	BQL(0.025)	1	BQL(0.041)	1
Silicon (Si)	7440-21-3	mg/L	0.047	0.157	21.5(RPD=0.00)	1	20.6	1	16.6	1	21.4	1	21.5	1	23.0	1
Sulfur (S)	7704-34-9	mg/L	0.054	0.180	0.215(RPD=0.47)	1	0.401	1	0.666	1	3.23	1	6.47	1	2.74	1
Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	0.752(RPD=1.07)	1	0.594	1	0.109	1	1.02	1	1.02	1	0.781	1
Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
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Laboratory: **Metals** Report Date: **2/4/08**

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Technical Directive: **4ME471HW**

Sample Results (1, 2)

Analysts: **Sandra Saye**

Method: **RSKSOP 213(3)**

Analytes		Unit	MDL	QL	Field Sample ID		ML6-5		ML6-6		ML6-7		ML7-3		ML7-4		ML7-5	
Names	Codes				Sample Lab ID		4221-10 Lab Dup		4221-11		4221-12		4221-13		4221-14		4221-15	
					Date Collected		1/23/08		1/23/08		1/23/08		1/23/08		1/23/08		1/24/08	
					Date Analyzed		2/4/08		2/4/08		2/4/08		2/4/08		2/4/08		2/4/08	
Names	Codes	Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.004	0.014	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.030	0.100	BQL(0.054)(RPD=NA)	1	BQL(0.033)	1	ND	1	ND	1	ND	1	ND	1	BQL(0.065)	1
Arsenic (As)	7440-38-2	mg/L	0.008	0.027	ND(RPD=NA)	1	ND	1	ND	1	0.072	1	ND	1	ND	1	ND	1
Boron (B)	7440-42-8	mg/L	0.004	0.014	0.150(RPD=1.32)	1	0.153	1	0.154	1	0.039	1	0.152	1	0.114	1		
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.209(RPD=0.48)	1	0.171	1	0.385	1	0.866	1	0.242	1	0.213	1		
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.028	0.094	96.7(RPD=0.10)	1	80.8	1	94.8	1	129	1	92.0	1	97.3	1		
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	BQL(0.002)	1	ND	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.003	0.010	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.008	0.027	33.6(RPD=0.30)	1	36.8	1	13.6	1	264	1	37.0	1	60.3	1		
Potassium (K)	7440-09-7	mg/L	0.092	0.307	3.50(RPD=0.29)	1	2.54	1	2.17	1	1.72	1	1.65	1	1.42	1		
Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077	21.0(RPD=0.00)	1	17.1	1	9.22	1	67.3	1	16.0	1	20.6	1		
Manganese (Mn)	7439-96-5	mg/L	0.002	0.007	0.401(RPD=0.75)	1	0.425	1	0.521	1	0.701	1	0.489	1	0.446	1		
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.004(RPD=NA)	1	0.004	1	BQL(0.002)	1	BQL(0.002)	1	BQL(0.003)	1	BQL(0.003)	1		
Sodium (Na)	7440-23-5	mg/L	0.091	0.304	75.6(RPD=0.26)	1	86.8	1	122	1	315	1	85.0	1	75.5	1		
Nickel (Ni)	7440-02-0	mg/L	0.006	0.020	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.003	0.010	BQL(0.006)(RPD=NA)	1	BQL(0.005)	1	ND	1	0.041	1	BQL(0.007)	1	0.010	1		
Antimony (Sb)	7440-36-0	mg/L	0.004	0.014	BQL(0.012)(RPD=NA)	1	BQL(0.010)	1	BQL(0.013)	1	0.018	1	0.015	1	BQL(0.012)	1		
Selenium (Se)	7782-49-2	mg/L	0.007	0.024	BQL(0.009)(RPD=NA)	1	BQL(0.010)	1	BQL(0.008)	1	0.026	1	BQL(0.010)	1	BQL(0.007)	1		
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.651(RPD=0.15)	1	0.537	1	1.42	1	2.32	1	1.07	1	0.888	1		
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND(RPD=NA)	1	ND	1	ND	1	BQL(0.007)	1	ND	1	ND	1	ND	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.016	0.054	BQL(0.041)(RPD=NA)	1	BQL(0.035)	1	BQL(0.039)	1	BQL(0.037)	1	BQL(0.035)	1	BQL(0.039)	1		
Silicon (Si)	7440-21-3	mg/L	0.047	0.157	23.0(RPD=0.00)	1	23.7	1	22.4	1	12.4	1	22.7	1	20.7	1		
Sulfur (S)	7704-34-9	mg/L	0.054	0.180	2.78(RPD=1.45)	1	1.59	1	0.686	1	0.863	1	0.721	1	0.719	1		
Phosphorus(P)	7723-14-0	mg/L	0.012	0.040	0.781(RPD=0.00)	1	0.233	1	0.281	1	0.123	1	0.183	1	0.715	1		
Uranium (U)	7440-61-1	mg/L	0.006	0.020	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
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Technical Directive:

4ME471HW

Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analytes		Unit	MDL	QL	Field Sample ID		ML7-6		ML7-7							
Names	Codes				Sample Lab ID		4221-16		4221-17							
Silver (Ag)	7440-22-4	mg/L	0.004	0.014			ND	1	ND	1						
Aluminum (Al)	7429-90-5	mg/L	0.030	0.100			ND	1	ND	1						
Arsenic (As)	7440-38-2	mg/L	0.008	0.027			ND	1	ND	1						
Boron (B)	7440-42-8	mg/L	0.004	0.014			0.149	1	0.165	1						
Barium (Ba)	7440-39-3	mg/L	0.001	0.004			0.872	1	0.759	1						
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004			ND	1	ND	1						
Calcium (Ca)	7440-70-2	mg/L	0.028	0.094			165	1	130	1						
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004			ND	1	ND	1						
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004			ND	1	ND	1						
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004			ND	1	ND	1						
Copper (Cu)	7440-50-8	mg/L	0.003	0.010			ND	1	ND	1						
Iron (Fe)	7439-89-6	mg/L	0.008	0.027			31.0	1	22.2	1						
Potassium (K)	7440-09-7	mg/L	0.092	0.307			1.92	1	1.96	1						
Magnesium (Mg)	7439-95-4	mg/L	0.023	0.077			17.2	1	14.2	1						
Manganese (Mn)	7439-96-5	mg/L	0.002	0.007			0.812	1	0.825	1						
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004			ND	1	BQL(0.001)	1						
Sodium (Na)	7440-23-5	mg/L	0.091	0.304			97.9	1	120	1						
Nickel (Ni)	7440-02-0	mg/L	0.006	0.020			ND	1	ND	1						
Lead (Pb)	7439-92-1	mg/L	0.003	0.010			BQL(0.005)	1	BQL(0.003)	1						
Antimony (Sb)	7440-36-0	mg/L	0.004	0.014			BQL(0.013)	1	0.014	1						
Selenium (Se)	7782-49-2	mg/L	0.007	0.024			BQL(0.012)	1	BQL(0.012)	1						
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004			2.79	1	2.00	1						
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007			ND	1	ND	1						
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017			ND	1	ND	1						
Vanadium (V)	7440-62-2	mg/L	0.004	0.014			ND	1	ND	1						
Zinc (Zn)	7440-66-6	mg/L	0.016	0.054			0.056	1	BQL(0.050)	1						
Silicon (Si)	7440-21-3	mg/L	0.047	0.157			21.2	1	21.9	1						
Sulfur (S)	7704-34-9	mg/L	0.054	0.180			0.399	1	0.506	1						
Phosphorus(P)	7723-14-0	mg/L	0.012	0.040			0.215	1	0.177	1						
Uranium (U)	7440-61-1	mg/L	0.006	0.020			ND	1	ND	1						

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **2/6/08**

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Technical Directive: **4ME471HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(2)**

Analytes		Unit	MDL		QL		Data		DF		Data		DF		Data		DF		Data		DF		Data		DF		Data		DF	
Names	Codes																													
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	7.38	1	7.28 (RPD=1.36)	1	14.6	1	5.24	1	4.65	1	20.6	1														
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.515	1	0.514 (RPD=0.19)	1	0.512	1	0.615	1	0.603	1	0.574	1														
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.366	1	0.347 (RPD=5.33)	1	0.328	1	BQL(0.157)	1	BQL(0.229)	1	BQL(0.228)	1														
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—														
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1														
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	3.35	1	3.53 (RPD=5.23)	1	3.25	1	4.13	1	3.85	1	4.50	1														
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.080	1	0.079 (RPD=1.26)	1	1.74	1	0.019	1	0.015	1	0.062	1														
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	0.498	1	0.458 (RPD=8.37)	1	0.991	1	ND	1	BQL(0.230)	1	5.42	1														
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	BQL(0.037)	1	BQL(0.029) (RPD=NA)	1	BQL(0.029)	1	BQL(0.018)	1	ND	1	BQL(0.041)	1														

Comments:
Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: 4ME471HW

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Analytes		Unit	MDL		QL		Data		DF		Data		DF		Data		DF		Data		DF	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	5.41	1	5.70	1	5.36	1	11.0	1	25.1	1	25.4 (RPD=1.19)	1						
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.776	1	0.473	1	0.474	1	0.196	1	0.220	1	0.214 (RPD=2.76)	1						
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.296	1	BQL(0.125)	1	BQL(0.155)	1	BQL(0.201)	1	BQL(0.192)	1	BQL(0.169) (RPD=NA)	1						
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—						
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1						
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	6.50	1	5.38	1	4.98	1	6.01	1	5.75	1	5.64 (RPD=1.93)	1						
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.020	1	0.347	1	0.303	1	0.038	1	0.047	1	0.047 (RPD=0.00)	1						
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	2.20	1	ND	1	ND	1	0.626	1	0.896	1	0.876 (RPD=2.26)	1						
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1						

Comments:
Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.

Analytical Service Results Report

Laboratory:Metals

Report Date:2/6/08

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Technical Directive:4ME471HW

Sample Results (1, 2)

Analysts:	Steve Markham		Field Sample ID		ML 1-4		ML 1-5		ML 1-7		ML 2-3		ML 2-4		ML 2-5			
	RSKSOP 257(2)				Sample Lab ID		4217-11		4217-12		4217-13		4217-14		4217-15		4217-16	
					Date Collected		1/18/08		1/18/08		1/18/08		1/18/08		1/20/08		1/20/08	
					Date Analyzed		1/24, 1/25 & 1/28/08		1/24, 1/25 & 1/28/08		1/24, 1/25 & 1/28/08		1/24, 1/25 & 1/28/08		1/24, 1/25 & 1/28/08		1/24, 1/25 & 1/28/08	
Method:																		
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																	
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	14.2	1	10.1	1	7.01	1	24.0	1	5.42	1	2.79	1		
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.345	1	0.352	1	0.168	1	0.172	1	0.534	1	0.445	1		
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	BQL(0.121)	1	BQL(0.145)	1	BQL(0.150)	1	1.00	1	0.388	1	BQL(0.099)	1		
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—		
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1		
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	3.95	1	3.47	1	2.09	1	5.04	1	3.99	1	3.02	1		
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.008	1	0.012	1	0.008	1	ND	1	ND	1	0.082	1		
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	0.878	1	1.12	1	1.07	1	2.26	1	1.46	1	0.994	1		
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	0.102	1	0.085	1	BQL(0.018)	1	0.072	1	BQL(0.024)	1		

Comments:

Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals** Report Date: **2/6/08**

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Technical Directive: **4ME471HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(2)**

Field Sample ID	ML 2-6	ML 2-7	FIELD BLANK	ML 3-3	ML 3-3	ML 3-4
Sample Lab ID	4217-17	4217-18	4217-19	4217-20	4217-20 Lab Dup.	4217-21
Date Collected	1/20/08	1/20/08	1/20/08	1/20/08	1/20/08	1/21/08
Date Analyzed	1/24, 1/25 & 1/28/08	1/24, 1/25 & 1/28/08	1/24, 1/25, 1/28 & 2/5/08	1/24, 1/25 & 1/28/08	1/24, 1/25 & 1/28/08	1/24, 1/25 & 1/28/08

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	3.22	1	5.17	1	ND	1	6.77	1	6.82 (RPD=0.74)	1	1.13	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.361	1	0.307	1	ND	1	ND	1	ND (RPD=NA)	1	BQL(0.098)	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	BQL(0.158)	1	BQL(0.157)	1	BQL(0.077)	1	1.08	1	1.12 (RPD=3.64)	1	0.368	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	ND	1	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	3.22	1	3.16	1	ND	1	6.52	1	6.72 (RPD=3.02)	1	4.70	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.392	1	0.287	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	1.30	1	0.600	1	ND	1	1.72	1	1.78 (RPD=3.43)	1	1.00	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	0.070	1	BQL(0.033)	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1

Comments:
 Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:
 1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
 Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 2/6/08

Technical Directive: 4ME471HW

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Analytes		Unit	Field Sample ID		ML 3-5		ML 3-7		ML 4-2		ML 4-3		ML 4-5		ML 4-6	
Names	Codes		Sample Lab ID													
			Date Collected		1/21/08		1/21/08		1/21/08		1/22/08		1/22/08		1/22/08	
			Date Analyzed		1/24, 1/25 & 1/28/08		1/24, 1/25 & 1/28/08		1/24, 1/25 & 1/28/08		1/24, 1/25 & 1/28/08		1/24, 1/25 & 1/28/08		1/24, 1/25 & 1/28/08	
			MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	1.42	1	0.797	1	7.09	1	74.9	1	0.751	1	0.938	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	BQL(0.030)	1	0.156	1	0.737	1	0.485	1	0.337	1	0.340	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.518	1	BQL(0.174)	1	0.599	1	BQL(0.239)	1	BQL(0.117)	1	BQL(0.136)	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	5.64	1	3.14	1	8.03	1	5.53	1	3.34	1	3.38	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.012	1	ND	1	0.007	1	ND	1	BQL(0.004)	1	ND	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	1.23	1	0.533	1	1.35	1	0.882	1	0.853	1	0.442	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	BQL(0.035)	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: **Metals**

Report Date: **2/6/08**

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Technical Directive: **4ME471HW**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(2)**

Field Sample ID	ML 4-7	ML 5-2	ML 5-3	DUPLICATE-3	ML 5-5	ML 5-6
Sample Lab ID	4217-28	4221-01	4221-02	4221-03	4221-04	4221-05
Date Collected	1/22/08	1/22/08	1/22/08	1/22/08	1/22/08	1/23/08
Date Analyzed	1/24, 1/25 & 1/28/08	1/28 & 1/29/08	1/28 & 1/29/08	1/28 & 1/29/08	1/28 & 1/29/08	1/28 & 1/29/08

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	0.979	1	9.06	1	—	—	—	—	1.50	1	1.39	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.283	1	0.774	1	0.290	1	0.299	1	0.589	1	0.538	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.708	1	BQL(0.097)	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	3.18	1	4.32	1	4.55	1	4.69	1	2.22	1	2.19	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.015	1	0.007	1	BQL(0.002)	1	ND	1	BQL(0.002)	1	ND	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	3.16	1	0.583	1	0.582	1	0.381	1	0.547	1	BQL(0.231)	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	BQL(0.028)	1	BQL(0.031)	1	ND	1	BQL(0.024)	1	ND	1

Comments:

Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applical. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 2/6/08

Technical Directive: 4ME471HW

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Field Sample ID	ML 5-6	ML 5-7	ML 6-3	ML 6-4	DUPLICATE-4	ML 6-5
Sample Lab ID	4221-05 Lab Dup.	4221-06	4221-07	4221-08	4221-09	4221-10
Date Collected	1/23/08	1/23/08	1/23/08	1/23/08	1/23/08	1/23/08
Date Analyzed	1/28 & 1/29/08	1/28 & 1/29/08	1/28 & 1/29/08	1/28 & 1/29/08	1/28 & 1/29/08	1/28 & 1/29/08

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	1.41 (RPD=1.43)	1	1.88	1	—	—	1.94	1	1.91	1	2.25	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.537 (RPD=0.19)	1	0.369	1	0.409	1	0.655	1	0.650	1	0.720	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	ND (RPD=NA)	1	BQL(0.090)	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	2.23 (RPD=1.81)	1	2.02	1	3.89	1	2.20	1	2.56	1	2.44	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND (RPD=NA)	1	0.024	1	BQL(0.003)	1	BQL(0.005)	1	BQL(0.005)	1	ND	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	0.348 (RPD=NA)	1	BQL(0.086)	1	0.607	1	ND	1	2.87	1	BQL(0.133)	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	BQL(0.019)	1

Comments:

Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 2/6/08

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Technical Directive: 4ME471HW

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Analysts:	Steve Markham		Field Sample ID		ML 6-5		ML 6-6		ML 6-7		ML 7-3		ML 7-4		ML 7-5		
	RSKSOP 257(2)				Sample Lab ID		4221-10 Lab Dup.		4221-11		4221-12		4221-13		4221-14		4221-15
Date Collected					1/23/08		1/23/08		1/23/08		1/23/08		1/23/08		1/24/08		
Date Analyzed					1/28 & 1/29/08		1/28 & 1/29/08		1/28 & 1/29/08		1/28 & 1/29/08		1/28 & 1/29/08		1/28 & 1/29/08		
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes																
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	2.23 (RPD=0.89)	1	3.90	1	2.19	1	—	—	1.40	1	1.50	1	
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.712 (RPD=1.12)	1	0.569	1	0.300	1	0.451	1	0.659	1	0.558	1	
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	BQL(0.139) (RPD=NA)	1	ND	1	ND	1	BQL(0.188)	1	BQL(0.139)	1	BQL(0.167)	1	
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—	
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	2.35 (RPD=3.76)	1	2.29	1	1.99	1	6.03	1	2.50	1	2.42	1	
Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND (RPD=NA)	1	ND	1	0.010	1	0.014	1	ND	1	ND	1	
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	0.265 (RPD=NA)	1	0.342	1	BQL(0.151)	1	0.692	1	1.25	1	0.379	1	
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1	

Comments:
Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 2/6/08

Technical Directive: 4ME471HW

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Field Sample ID	ML 7-6	ML 7-7				
Sample Lab ID	4221-16	4221-17				
Date Collected	1/24/08	1/24/08				
Date Analyzed	1/28 & 1/29/08	1/28 & 1/29/08				

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	1.77	1	2.37	1								
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.340	1	0.327	1								
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.250	1	BQL(0.174)	1								
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—								
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1								
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	2.44	1	2.25	1								
Uranium (U)	7440-61-1	µg/L	0.002	0.007	BQL(0.003)	1	ND	1								
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	0.633	1	ND	1								
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND	1								

Comments:

Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental and Infrastructure, Inc.

Analytical Service Results Report

Laboratory:

Metals

Report Date:

8/4/08

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Technical Directive:

5ME512SF

Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analytes		Unit	Field Sample ID		PMW-3		PMW-3		PMW-2		PMW-1		PMW-6		Duplicate1	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.002	0.007	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.022	0.074	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Boron (B)	7440-42-8	mg/L	0.005	0.017	0.164	1	0.166(RPD=1.21)	1	0.166	1	0.084	1	0.148	1	0.162	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.021	1	0.022(RPD=4.65)	1	0.018	1	0.073	1	0.028	1	0.022	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.036	0.120	17.7	1	17.9(RPD=1.12)	1	23.0	1	56.7	1	19.2	1	17.7	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.002	0.007	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	6.84	1	6.94(RPD=1.45)	1	4.55	1	61.4	1	9.63	1	6.86	1
Potassium (K)	7440-09-7	mg/L	0.058	0.194	1.62	1	1.64(RPD=1.23)	1	0.903	1	2.47	1	1.12	1	1.63	1
Magnesium (Mg)	7439-95-4	mg/L	0.007	0.024	5.82	1	5.87(RPD=0.86)	1	4.87	1	7.74	1	5.19	1	5.73	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.062	1	0.062(RPD=0.00)	1	0.050	1	0.281	1	0.064	1	0.062	1
Molybdenum (Mo)	7439-98-7	mg/L	0.002	0.007	BQL(0.003)	1	BQL(0.003)(RPD=NA)	1	BQL(0.005)	1	BQL(0.006)	1	BQL(0.005)	1	BQL(0.004)	1
Sodium (Na)	7440-23-5	mg/L	0.034	0.114	57.4	1	57.7(RPD=0.52)	1	55.3	1	42.8	1	55.7	1	57.1	1
Nickel (Ni)	7440-02-0	mg/L	0.002	0.007	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	BQL(0.002)	1	BQL(0.002)(RPD=NA)	1	ND	1	0.008	1	ND	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.008)	1	BQL(0.007)(RPD=NA)	1	BQL(0.010)	1	0.015	1	BQL(0.009)	1	BQL(0.009)	1
Selenium (Se)	7782-49-2	mg/L	0.004	0.014	0.018	1	0.018(RPD=0.00)	1	0.029	1	0.039	1	0.031	1	0.031	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.099	1	0.100(RPD=1.01)	1	0.096	1	0.251	1	0.090	1	0.099	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.029	0.097	16.5	1	16.5(RPD=0.00)	1	17.0	1	10.4	1	17.5	1	16.3	1
Sulfur (S)	7704-34-9	mg/L	0.021	0.070	26.0	1	25.9(RPD=0.39)	1	12.4	1	3.84	1	71.9	1	33.1	1
Phosphorus (P)	7723-14-0	mg/L	0.028	0.094	1.52	1	1.52(RPD=0.00)	1	1.46	1	0.720	1	1.59	1	1.52	1
Uranium (U)	7440-61-1	mg/L	0.009	0.030	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1

Comments:

The MDL and QL'S represent those determined in June 2008, but not yet updated in RSKSOP-213(3)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

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Analytes		Unit	MDL	QL	Field Sample ID		PMW-5		PMW-4		ML1-2		ML1-4		ML1-6		ML2-3	
Names	Codes				Sample Lab ID		4408-12		4408-13		4408-14		4408-15		4408-16		4408-17	
					Date Collected		7/16/08		7/16/08		7/17/08		7/17/08		7/17/08		7/17/08	
					Date Analyzed		7/24/08		7/24/08		7/24/08		7/24/08		7/24/08		7/24/08	
					Data	DF			Data	DF			Data	DF			Data	DF
Silver (Ag)	7440-22-4	mg/L	0.002	0.007	ND	1			ND	1			ND	1			BQL(0.002)	1
Aluminum (Al)	7429-90-5	mg/L	0.022	0.074	ND	1			ND	1			ND	1			ND	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND	1			ND	1			ND	1			ND	1
Boron (B)	7440-42-8	mg/L	0.005	0.017	0.122	1			0.156	1			0.154	1			0.182	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.084	1			0.046	1			0.193	1			0.097	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1			ND	1			ND	1			ND	1
Calcium (Ca)	7440-70-2	mg/L	0.036	0.120	48.1	1			12.9	1			69.5	1			29.4	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1			ND	1			ND	1			ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1			ND	1			ND	1			ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1			ND	1			ND	1			ND	1
Copper (Cu)	7440-50-8	mg/L	0.002	0.007	BQL(0.002)	1			ND	1			ND	1			ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	68.0	1			12.7	1			37.8	1			10.4	1
Potassium (K)	7440-09-7	mg/L	0.058	0.194	4.45	1			0.978	1			3.16	1			1.25	1
Magnesium (Mg)	7439-95-4	mg/L	0.007	0.024	10.0	1			5.88	1			12.5	1			7.79	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.245	1			0.038	1			0.433	1			0.145	1
Molybdenum (Mo)	7439-98-7	mg/L	0.002	0.007	BQL(0.006)	1			BQL(0.005)	1			BQL(0.006)	1			BQL(0.005)	1
Sodium (Na)	7440-23-5	mg/L	0.034	0.114	57.0	1			54.6	1			80.2	1			65.6	1
Nickel (Ni)	7440-02-0	mg/L	0.002	0.007	ND	1			ND	1			ND	1			123	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	0.008	1			ND	1			BQL(0.005)	1			ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	0.014	1			BQL(0.008)	1			0.016	1			BQL(0.007)	1
Selenium (Se)	7782-49-2	mg/L	0.004	0.014	0.026	1			0.030	1			0.046	1			0.033	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.269	1			0.075	1			0.803	1			0.320	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1			ND	1			ND	1			0.131	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1			ND	1			ND	1			ND	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1			ND	1			ND	1			ND	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1			ND	1			ND	1			ND	1
Silicon (Si)	7440-21-3	mg/L	0.029	0.097	17.9	1			15.2	1			9.84	1			17.4	1
Sulfur (S)	7704-34-9	mg/L	0.021	0.070	126	1			14.2	1			7.29	1			17.0	1
Phosphorus (P)	7723-14-0	mg/L	0.028	0.094	1.36	1			1.19	1			0.110	1			1.15	1
Uranium (U)	7440-61-1	mg/L	0.009	0.030	ND	1			ND	1			ND	1			ND	1

Comments:

The MDL and QL'S represent those determined in June 2008, but not yet updated in RSKSOP-213(3)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

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Analytes		Unit	MDL		Data		DF	Data		DF	Data		DF	Data		DF	Data		DF
Names	Codes																		
Silver (Ag)	7440-22-4	mg/L	0.002	0.007	ND(RPD=NA)		1	ND	1		ND	1		ND	1		ND	1	
Aluminum (Al)	7429-90-5	mg/L	0.022	0.074	ND(RPD=NA)		1	ND	1		ND	1		ND	1		ND	1	
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND(RPD=NA)		1	ND	1		ND	1		ND	1		ND	1	
Boron (B)	7440-42-8	mg/L	0.005	0.017	BQL(0.012)(RPD=NA)		1	0.158	1		0.159	1		0.158	1		0.061	1	
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	1.29(RPD=0.77)		1	0.041	1		0.027	1		0.053	1		0.430	1	
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND(RPD=NA)		1	ND	1		ND	1		ND	1		ND	1	
Calcium (Ca)	7440-70-2	mg/L	0.036	0.120	277(RPD=0.00)		1	33.0	1		43.4	1		66.6	1		57.4	1	
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.006(RPD=0.00)		1	ND	1		ND	1		ND	1		ND	1	
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND(RPD=NA)		1	ND	1		ND	1		ND	1		BQL(0.004)	1	
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND(RPD=NA)		1	ND	1		ND	1		ND	1		ND	1	
Copper (Cu)	7440-50-8	mg/L	0.002	0.007	BQL(0.004)(RPD=NA)		1	ND	1		ND	1		ND	1		ND	1	
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	256(RPD=0.00)		1	2.85	1		3.55	1		3.15	1		46.5	1	
Potassium (K)	7440-09-7	mg/L	0.058	0.194	2.42(RPD=0.83)		1	0.819	1		1.11	1		1.55	1		97.3	1	
Magnesium (Mg)	7439-95-4	mg/L	0.007	0.024	103(RPD=0.98)		1	3.86	1		5.29	1		5.52	1		10.5	1	
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	1.27(RPD=0.00)		1	0.151	1		0.163	1		0.320	1		0.244	1	
Molybdenum (Mo)	7439-98-7	mg/L	0.002	0.007	ND(RPD=NA)		1	BQL(0.004)	1		BQL(0.004)	1		BQL(0.005)	1		BQL(0.003)	1	
Sodium (Na)	7440-23-5	mg/L	0.034	0.114	159(RPD=0.00)		1	56.5	1		68.2	1		101	1		139	1	
Nickel (Ni)	7440-02-0	mg/L	0.002	0.007	BQL(0.004)(RPD=NA)		1	ND	1		ND	1		ND	1		BQL(0.006)	1	
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	0.040(RPD=2.53)		1	ND	1		ND	1		ND	1		0.008	1	
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	0.020(RPD=5.13)		1	BQL(0.007)	1		BQL(0.009)	1		0.011	1		0.012	1	
Selenium (Se)	7782-49-2	mg/L	0.004	0.014	0.021(RPD=21.05)		1	0.021	1		0.021	1		0.027	1		BQL(0.011)	1	
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	4.28(RPD=0.23)		1	0.301	1		0.480	1		0.970	1		1.08	1	
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND(RPD=NA)		1	ND	1		ND	1		ND	1		ND	1	
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND(RPD=NA)		1	ND	1		ND	1		ND	1		ND	1	
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND(RPD=NA)		1	ND	1		ND	1		ND	1		ND	1	
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND(RPD=NA)		1	ND	1		ND	1		ND	1		ND	1	
Silicon (Si)	7440-21-3	mg/L	0.029	0.097	10.1(RPD=1.00)		1	17.6	1		17.7	1		17.4	1		2.88	1	
Sulfur (S)	7704-34-9	mg/L	0.021	0.070	4.68(RPD=4.81)		1	13.7	1		12.9	1		11.4	1		1.61	1	
Phosphorus (P)	7723-14-0	mg/L	0.028	0.094	0.379(RPD=0.26)		1	1.73	1		1.35	1		0.571	1		BQL(0.042)	1	
Uranium (U)	7440-61-1	mg/L	0.009	0.030	BQL(0.017)(RPD=NA)		1	ND	1		ND	1		ND	1		ND	1	

Comments:

The MDL and QL'S represent those determined in June 2008, but not yet updated in RSKSOP-213(3)

Notes:

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Shaw Environmental and Infrastructure, Inc.

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

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Analytes		Unit	MDL	QL	Field Sample ID		ML3-6		ML5-3		ML5-4		ML5-5		ML5-6		ML5-7	
Names	Codes				Sample Lab ID		4408-23		4408-24		4408-25		4408-26		4408-27		4408-28	
					Date Collected		7/18/08		7/18/08		7/18/08		7/18/08		7/18/08		7/18/08	
					Date Analyzed		7/24/08		7/24/08		7/24/08		7/24/08		7/24/08		7/24/08	
					Data	DF			Data	DF			Data	DF			Data	DF
Silver (Ag)	7440-22-4	mg/L	0.002	0.007	BQL(0.002)	1		ND	1		ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.022	0.074	ND	1		ND	1		ND	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND	1		0.160	1		ND	1	ND	1	ND	1	ND	1
Boron (B)	7440-42-8	mg/L	0.005	0.017	0.074	1		0.111	1		0.177	1	0.159	1	0.157	1	0.145	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.040	1		0.235	1		0.020	1	0.081	1	0.108	1	0.273	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1		ND	1		ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.036	0.120	20.6	1		63.8	1		19.9	1	32.5	1	48.2	1	67.6	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.002)	1		BQL(0.001)	1		ND	1	ND	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1		ND	1		ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1		ND	1		ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.002	0.007	BQL(0.002)	1		ND	1		ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	115	1		75.1	1		4.82	1	8.30	1	13.9	1	8.13	1
Potassium (K)	7440-09-7	mg/L	0.058	0.194	1.48	1		1.48	1		1.54	1	1.49	1	1.22	1	1.67	1
Magnesium (Mg)	7439-95-4	mg/L	0.007	0.024	12.6	1		31.2	1		7.40	1	5.60	1	8.21	1	7.52	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.221	1		0.240	1		0.045	1	0.152	1	0.272	1	0.377	1
Molybdenum (Mo)	7439-98-7	mg/L	0.002	0.007	BQL(0.007)	1		BQL(0.007)	1		BQL(0.003)	1	BQL(0.004)	1	BQL(0.005)	1	BQL(0.005)	1
Sodium (Na)	7440-23-5	mg/L	0.034	0.114	114	1		121	1		57.1	1	56.7	1	78.8	1	118	1
Nickel (Ni)	7440-02-0	mg/L	0.002	0.007	BQL(0.003)	1		ND	1		ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	0.014	1		0.011	1		ND	1	ND	1	ND	1	ND	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	0.021	1		0.015	1		BQL(0.008)	1	BQL(0.008)	1	0.011	1	0.015	1
Selenium (Se)	7782-49-2	mg/L	0.004	0.014	0.064	1		0.039	1		0.021	1	0.024	1	0.022	1	0.031	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.310	1		0.667	1		0.119	1	0.307	1	0.436	1	0.821	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1		ND	1		ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1		ND	1		ND	1	ND	1	ND	1	ND	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1		ND	1		ND	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1		ND	1		ND	1	ND	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.029	0.097	16.5	1		10.8	1		17.2	1	17.8	1	19.7	1	18.9	1
Sulfur (S)	7704-34-9	mg/L	0.021	0.070	BQL(0.032)	1		1.37	1		14.8	1	8.95	1	2.47	1	0.705	1
Phosphorus (P)	7723-14-0	mg/L	0.028	0.094	0.461	1		0.602	1		1.61	1	1.41	1	1.02	1	0.718	1
Uranium (U)	7440-61-1	mg/L	0.009	0.030	ND	1		ND	1		ND	1	ND	1	ND	1	ND	1

Comments:

The MDL and QL'S represent those determined in June 2008, but not yet updated in RSKSOP-213(3)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Shaw Environmental and Infrastructure, Inc.

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analytes		Unit	Field Sample ID		FIELD BLANK		ML6-3		ML6-3		ML6-4		ML6-5		ML6-6	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.002	0.007	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.022	0.074	ND	1	ND	1	ND(RPD=NA)	1	ND	1	BQL(0.038)	1	BQL(0.026)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND	1	0.043	1	0.041(RPD=4.76)	1	ND	1	ND	1	ND	1
Boron (B)	7440-42-8	mg/L	0.005	0.017	ND	1	0.156	1	0.161(RPD=3.15)	1	0.163	1	0.117	1	0.131	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	ND	1	0.417	1	0.413(RPD=0.96)	1	0.238	1	0.153	1	0.116	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.036	0.120	ND	1	108	1	108(RPD=0.00)	1	61.3	1	76.9	1	77.8	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	BQL(0.001)	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.002	0.007	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	ND	1	40.5	1	40.6(RPD=0.25)	1	9.78	1	33.8	1	32.0	1
Potassium (K)	7440-09-7	mg/L	0.058	0.194	ND	1	1.68	1	1.67(RPD=0.60)	1	2.42	1	2.22	1	2.01	1
Magnesium (Mg)	7439-95-4	mg/L	0.007	0.024	ND	1	26.2	1	26.3(RPD=0.38)	1	10.1	1	16.3	1	16.2	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	ND	1	0.501	1	0.508(RPD=1.39)	1	0.274	1	0.358	1	0.453	1
Molybdenum (Mo)	7439-98-7	mg/L	0.002	0.007	ND	1	BQL(0.004)	1	BQL(0.003)(RPD=NA)	1	BQL(0.003)	1	BQL(0.005)	1	BQL(0.004)	1
Sodium (Na)	7440-23-5	mg/L	0.034	0.114	ND	1	86.7	1	86.1(RPD=0.69)	1	56.0	1	65.7	1	84.5	1
Nickel (Ni)	7440-02-0	mg/L	0.002	0.007	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	ND	1	0.009	1	0.008(RPD=11.76)	1	BQL(0.004)	1	BQL(0.005)	1	0.007	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	ND	1	0.014	1	0.013(RPD=7.41)	1	BQL(0.007)	1	0.010	1	BQL(0.009)	1
Selenium (Se)	7782-49-2	mg/L	0.004	0.014	ND	1	0.018	1	0.018(RPD=0.00)	1	BQL(0.005)	1	ND	1	BQL(0.006)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	ND	1	1.51	1	1.50(RPD=0.66)	1	0.698	1	0.467	1	0.466	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.029	0.097	ND	1	20.9	1	21.0(RPD=0.48)	1	18.9	1	19.4	1	22.2	1
Sulfur (S)	7704-34-9	mg/L	0.021	0.070	ND	1	1.01	1	1.00(RPD=1.00)	1	35.2	1	18.7	1	2.37	1
Phosphorus (P)	7723-14-0	mg/L	0.028	0.094	ND	1	0.152	1	0.150(RPD=1.32)	1	1.06	1	0.796	1	0.290	1
Uranium (U)	7440-61-1	mg/L	0.009	0.030	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1

Comments:

The MDL and QL'S represent those determined in June 2008, but not yet updated in RSKSOP-213(3)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Shaw Environmental and Infrastructure, Inc.

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analysts:	Sandra Saye	Field Sample ID			ML6-7		ML7-4		ML7-5		ML7-6		ML7-7		ML4-3			
		Sample Lab ID			4408-34		4408-35		4408-36		4408-37		4408-38		4408-39			
		Date Collected			7/19/08		7/19/08		7/19/08		7/19/08		7/19/08		7/21/08			
		Date Analyzed			7/28/08		7/28/08		7/28/08		7/28/08		7/28/08		7/28/08			
Method:	RSKSOP 213(3)																	
		Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF		
		Names	Codes															

Comments:

The MDL and QL'S represent those determined in June 2008, but not yet updated in RSKSOP-213(3)

Notes:

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Shaw Environmental and Infrastructure, Inc.

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analytes		Unit	Field Sample ID		ML4-3		ML4-4		ML4-5		ML4-6		ML4-7		ML3-5	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.002	0.007	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.022	0.074	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	0.067(RPD=4.38)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Boron (B)	7440-42-8	mg/L	0.005	0.017	0.081(RPD=1.24)	1	0.155	1	0.139	1	0.139	1	0.134	1	BQL(0.013)	1
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.165(RPD=1.22)	1	0.166	1	0.106	1	0.084	1	0.264	1	0.353	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.036	0.120	52.4(RPD=0.57)	1	34.9	1	46.0	1	42.4	1	71.1	1	103	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	BQL(0.002)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.002	0.007	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	64.4(RPD=0.16)	1	13.7	1	8.96	1	8.69	1	9.00	1	97.7	1
Potassium (K)	7440-09-7	mg/L	0.058	0.194	1.28(RPD=0.78)	1	1.25	1	1.52	1	1.42	1	1.40	1	28.7	1
Magnesium (Mg)	7439-95-4	mg/L	0.007	0.024	27.4(RPD=0.73)	1	7.55	1	9.04	1	8.70	1	7.48	1	18.0	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.208(RPD=0.48)	1	0.171	1	0.203	1	0.204	1	0.404	1	0.573	1
Molybdenum (Mo)	7439-98-7	mg/L	0.002	0.007	BQL(0.005)(RPD=NA)	1	BQL(0.004)	1	BQL(0.004)	1	BQL(0.004)	1	BQL(0.005)	1	BQL(0.006)	1
Sodium (Na)	7440-23-5	mg/L	0.034	0.114	53.2(RPD=0.75)	1	55.8	1	66.4	1	71.7	1	92.9	1	103	1
Nickel (Ni)	7440-02-0	mg/L	0.002	0.007	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	0.013(RPD=0.00)	1	BQL(0.004)	1	BQL(0.002)	1	BQL(0.003)	1	ND	1	0.015	1
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	0.013(RPD=0.00)	1	0.012	1	BQL(0.008)	1	0.011	1	0.012	1	0.019	1
Selenium (Se)	7782-49-2	mg/L	0.004	0.014	0.018(RPD=5.71)	1	0.026	1	0.018	1	0.028	1	0.036	1	0.038	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.504(RPD=1.00)	1	0.368	1	0.370	1	0.329	1	0.630	1	0.931	1
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.029	0.097	8.90(RPD=0.11)	1	16.6	1	16.1	1	16.1	1	17.5	1	8.64	1
Sulfur (S)	7704-34-9	mg/L	0.021	0.070	0.924(RPD=6.25)	1	0.930	1	0.397	1	0.352	1	0.520	1	ND	1
Phosphorus (P)	7723-14-0	mg/L	0.028	0.094	0.293(RPD=2.07)	1	1.27	1	1.35	1	1.22	1	0.939	1	0.579	1
Uranium (U)	7440-61-1	mg/L	0.009	0.030	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

The MDL and QL'S represent those determined in June 2008, but not yet updated in RSKSOP-213(3)

Notes:

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Shaw Environmental and Infrastructure, Inc.

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analysts:	Sandra Saye	Field Sample ID		ML3-7		ML2-4		ML1-3		ML1-5		ML1-5		ML1-7				
		Sample Lab ID		4411-04		4411-05		4411-06		4411-07		4411-07 Lab Dup		4411-08				
		Date Collected		7/21/08		7/21/08		7/22/08		7/22/08		7/22/08		7/22/08				
		Date Analyzed		7/28/08		7/28/08		7/28/08		7/28/08		7/28/08		7/28/08				
Method:	RSKSOP 213(3)	Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
		Names	Codes															
		Silver (Ag)	7440-22-4	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1
		Aluminum (Al)	7429-90-5	mg/L	0.022	0.074	ND	1	BQL(0.038)	1	ND	1	ND	1	ND(RPD=NA)	1	BQL(0.024)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1		
Boron (B)	7440-42-8	mg/L	0.005	0.017	0.106	1	0.172	1	0.179	1	0.174	1	0.174(RPD=0.00)	1	0.136	1		
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.049	1	0.469	1	0.290	1	0.144	1	0.144(RPD=0.00)	1	0.140	1		
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1		
Calcium (Ca)	7440-70-2	mg/L	0.036	0.120	33.6	1	114	1	63.1	1	45.9	1	46.1(RPD=0.43)	1	45.4	1		
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1		
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1		
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1		
Copper (Cu)	7440-50-8	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1		
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	17.1	1	23.0	1	10.6	1	6.16	1	6.17(RPD=0.16)	1	4.55	1		
Potassium (K)	7440-09-7	mg/L	0.058	0.194	1.62	1	1.60	1	1.82	1	1.35	1	1.33(RPD=1.49)	1	1.48	1		
Magnesium (Mg)	7439-95-4	mg/L	0.007	0.024	5.71	1	21.4	1	11.6	1	5.85	1	5.86(RPD=0.17)	1	5.21	1		
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.237	1	0.523	1	0.287	1	0.245	1	0.245(RPD=0.00)	1	0.260	1		
Molybdenum (Mo)	7439-98-7	mg/L	0.002	0.007	BQL(0.004)	1	BQL(0.004)	1	BQL(0.004)	1	BQL(0.003)	1	BQL(0.003)(RPD=NA)	1	BQL(0.004)	1		
Sodium (Na)	7440-23-5	mg/L	0.034	0.114	101	1	79.5	1	88.6	1	87.7	1	88.0(RPD=0.34)	1	137	1		
Nickel (Ni)	7440-02-0	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1		
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	BQL(0.003)	1	BQL(0.005)	1	BQL(0.003)	1	ND	1	ND(RPD=NA)	1	BQL(0.003)	1		
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	BQL(0.008)	1	0.012	1	BQL(0.009)	1	BQL(0.007)	1	BQL(0.007)(RPD=NA)	1	BQL(0.008)	1		
Selenium (Se)	7782-49-2	mg/L	0.004	0.014	0.019	1	0.029	1	0.026	1	BQL(0.013)	1	0.016(RPD=NA)	1	0.016	1		
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.222	1	1.41	1	0.998	1	0.687	1	0.690(RPD=0.44)	1	0.490	1		
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1		
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1		
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1		
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1		
Silicon (Si)	7440-21-3	mg/L	0.029	0.097	21.1	1	21.2	1	15.1	1	17.3	1	17.4(RPD=0.58)	1	19.7	1		
Sulfur (S)	7704-34-9	mg/L	0.021	0.070	0.879	1	2.56	1	11.0	1	9.95	1	10.0(RPD=0.50)	1	1.67	1		
Phosphorus (P)	7723-14-0	mg/L	0.028	0.094	1.31	1	0.595	1	0.710	1	0.974	1	0.983(RPD=0.92)	1	1.08	1		
Uranium (U)	7440-61-1	mg/L	0.009	0.030	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1		

Comments:

The MDL and QL'S represent those determined in June 2008, but not yet updated in RSKSOP-213(3)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. * - denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental and Infrastructure, Inc.

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analysts:	Sandra Saye	Field Sample ID			ML2-2		ML3-3		ML5-2		ML6-2		ML7-2		ML4-2		
		Sample Lab ID			4411-09		4411-10		4411-11		4411-12		4411-13		4411-14		
		Date Collected			7/22/08		7/22/08		7/22/08		7/23/08/		7/23/08/		7/23/08/		
		Date Analyzed			7/28/08		7/28/08		7/28/08		7/28/08		7/28/08		7/28/08		
Method:	RSKSOP 213(3)																
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																
Silver (Ag)	7440-22-4	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Aluminum (Al)	7429-90-5	mg/L	0.022	0.074	ND	1	ND	1	BQL(0.026)	1	ND	1	ND	1	ND	1	
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Boron (B)	7440-42-8	mg/L	0.005	0.017	ND	1	ND	1	0.024	1	ND	1	ND	1	0.141	1	
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.226	1	0.953	1	0.297	1	0.178	1	1.03	1	0.662	1	
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Calcium (Ca)	7440-70-2	mg/L	0.036	0.120	88.4	1	259	1	70.0	1	99.7	1	229	1	109	1	
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.005	1	0.014	1	BQL(0.003)	1	BQL(0.003)	1	0.020	1	0.006	1	
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Copper (Cu)	7440-50-8	mg/L	0.002	0.007	BQL(0.002)	1	BQL(0.005)	1	BQL(0.003)	1	BQL(0.003)	1	BQL(0.005)	1	BQL(0.002)	1	
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	254	1	506	1	194	1	191	1	648	1	271	1	
Potassium (K)	7440-09-7	mg/L	0.058	0.194	1.91	1	9.28	1	2.72	1	7.62	1	6.46	1	9.18	1	
Magnesium (Mg)	7439-95-4	mg/L	0.007	0.024	62.1	1	88.2	1	38.1	1	34.3	1	97.1	1	54.7	1	
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.570	1	0.712	1	0.301	1	0.281	1	1.31	1	0.618	1	
Molybdenum (Mo)	7439-98-7	mg/L	0.002	0.007	0.008	1	BQL(0.004)	1	BQL(0.007)	1	BQL(0.006)	1	ND	1	BQL(0.006)	1	
Sodium (Na)	7440-23-5	mg/L	0.034	0.114	92.8	1	159	1	125	1	119	1	234	1	154	1	
Nickel (Ni)	7440-02-0	mg/L	0.002	0.007	BQL(0.003)	1	0.009	1	BQL(0.003)	1	BQL(0.002)	1	0.009	1	BQL(0.004)	1	
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	0.042	1	0.083	1	0.033	1	0.031	1	0.102	1	0.043	1	
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	0.022	1	0.031	1	0.017	1	0.019	1	0.034	1	0.021	1	
Selenium (Se)	7782-49-2	mg/L	0.004	0.014	0.025	1	0.021	1	0.020	1	BQL(0.014)	1	0.020	1	0.016	1	
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.740	1	3.36	1	0.662	1	0.854	1	3.49	1	1.43	1	
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1	0.029	1	ND	1	ND	1	0.039	1	BQL(0.007)	1	
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Silicon (Si)	7440-21-3	mg/L	0.029	0.097	12.5	1	5.99	1	7.26	1	13.8	1	23.0	1	7.65	1	
Sulfur (S)	7704-34-9	mg/L	0.021	0.070	5.63	1	ND	1	4.36	1	3.59	1	2.13	1	2.63	1	
Phosphorus (P)	7723-14-0	mg/L	0.028	0.094	0.254	1	0.335	1	0.186	1	0.146	1	0.434	1	0.188	1	
Uranium (U)	7440-61-1	mg/L	0.009	0.030	ND	1	0.030	1	ND	1	ND	1	BQL(0.021)	1	ND	1	

Comments:

The MDL and QL'S represent those determined in June 2008, but not yet updated in RSKSOP-213(3)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. * -* denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental and Infrastructure, Inc.

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analytes		Unit	MDL	QL	Field Sample ID		ML7-3		Duplicate 2							
Names	Codes				Sample Lab ID		4411-15		4411-16							
					Date Collected		7/23/08/		7/21/08							
					Date Analyzed		7/28/08		7/28/08							
					Data	DF			Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.002	0.007	ND	1			ND	1						
Aluminum (Al)	7429-90-5	mg/L	0.022	0.074	BQL(0.030)	1			BQL(0.049)	1						
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	0.022	1			ND	1						
Boron (B)	7440-42-8	mg/L	0.005	0.017	ND	1			0.170	1						
Barium (Ba)	7440-39-3	mg/L	0.001	0.004	0.914	1			0.484	1						
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1			ND	1						
Calcium (Ca)	7440-70-2	mg/L	0.036	0.120	112	1			116	1						
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	0.005	1			ND	1						
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1			ND	1						
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1			ND	1						
Copper (Cu)	7440-50-8	mg/L	0.002	0.007	BQL(0.002)	1			ND	1						
Iron (Fe)	7439-89-6	mg/L	0.005	0.017	239	1			22.9	1						
Potassium (K)	7440-09-7	mg/L	0.058	0.194	1.80	1			1.62	1						
Magnesium (Mg)	7439-95-4	mg/L	0.007	0.024	67.0	1			21.3	1						
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.554	1			0.528	1						
Molybdenum (Mo)	7439-98-7	mg/L	0.002	0.007	BQL(0.005)	1			BQL(0.004)	1						
Sodium (Na)	7440-23-5	mg/L	0.034	0.114	262	1			81.3	1						
Nickel (Ni)	7440-02-0	mg/L	0.002	0.007	BQL(0.004)	1			ND	1						
Lead (Pb)	7439-92-1	mg/L	0.002	0.007	0.038	1			BQL(0.005)	1						
Antimony (Sb)	7440-36-0	mg/L	0.003	0.010	0.022	1			0.014	1						
Selenium (Se)	7782-49-2	mg/L	0.004	0.014	0.021	1			0.027	1						
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	1.89	1			1.44	1						
Titanium (Ti)	7440-32-6	mg/L	0.001	0.004	ND	1			ND	1						
Thallium (Tl)	7440-28-0	mg/L	0.005	0.017	ND	1			ND	1						
Vanadium (V)	7440-62-2	mg/L	0.004	0.014	ND	1			ND	1						
Zinc (Zn)	7440-66-6	mg/L	0.006	0.020	ND	1			ND	1						
Silicon (Si)	7440-21-3	mg/L	0.029	0.097	14.0	1			21.2	1						
Sulfur (S)	7704-34-9	mg/L	0.021	0.070	3.59	1			2.46	1						
Phosphorus (P)	7723-14-0	mg/L	0.028	0.094	0.186	1			0.578	1						
Uranium (U)	7440-61-1	mg/L	0.009	0.030	ND	1			ND	1						

Comments:

The MDL and QL'S represent those determined in June 2008, but not yet updated in RSKSOP-213(3)

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Shaw Environmental and Infrastructure, Inc.

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Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Analytes		Unit	MDL		QL		Data		DF		Data		DF		Data		DF		Data		DF		Data		DF		Data		DF	
Names	Codes		MDL		QL		Data		DF		Data		DF		Data		DF		Data		DF		Data		DF		Data		DF	
Arsenic (As)	7440-38-2	µg/L	0.014	0.047			4.02		1		6.25		1		6.15 (RPD=1.61)		1		7.54		1		2.51		1		5.43		1	
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100			0.606		1		0.567		1		0.557 (RPD=1.78)		1		0.680		1		0.510		1		0.588		1	
Copper (Cu)	7440-50-8	µg/L	0.072	0.240			BQL(0.131)		1		BQL(0.148)		1		BQL(0.139) (RPD=NA)		1		0.368		1		BQL(0.171)		1		BQL(0.173)		1	
Iron (Fe)	7439-89-6	µg/L	0.289	0.964			—		—		—		—		—		—		—		—		—		—		—		—	
Lead (Pb)	7439-92-1	µg/L	0.025	0.084			ND		1		ND		1		ND (RPD=NA)		1		ND		1		ND		1		ND		1	
Selenium (Se)	7782-49-2	µg/L	0.169	0.564			4.43		1		2.87		1		2.95 (RPD=2.75)		1		2.77		1		3.47		1		3.89		1	
Uranium (U)	7440-61-1	µg/L	0.002	0.007			0.010		1		0.028		1		0.029 (RPD=3.51)		1		0.118		1		0.017		1		0.007		1	
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264			0.357		1		0.555		1		0.542 (RPD=2.27)		1		0.838		1		BQL(0.150)		1		BQL(0.228)		1	
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057			ND		1		ND		1		ND (RPD=NA)		1		ND		1		ND		1		ND		1	

Comments:
Per the Technical Directive, selective elements with values less than the ICP quantitation limit where analyzed by ICP-MS. Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental and Infrastructure, Inc.

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Sample Results (1, 2)

Analysts:

Steve Markham

Method:

RSKSOP 257(2)

Field Sample ID	PMW-5	PMW-4	ML 1-2	ML 1-4	ML 1-6	ML 1-6
Sample Lab ID	4408-12	4408-13	4408-14	4408-15	4408-16	4408-16 Lab Dup.
Date Collected	7/16/08	7/16/08	7/17/08	7/17/08	7/17/08	7/17/08
Date Analyzed	7/28 & 8/4/08	7/28 & 8/4/08	7/28 & 8/4/08	7/28 & 8/4/08	7/28, 7/30 & 8/4/08	7/28, 7/30 & 8/4/08

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	5.58	1	19.8	1	3.90	1	10.0	1	1.04	1	1.06 (RPD=1.90)	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.810	1	0.618	1	0.226	1	0.458	1	0.231	1	0.222 (RPD=3.97)	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.402	1	BQL(0.185)	1	0.367	1	BQL(0.165)	1	BQL(0.188)	1	BQL(0.188) (RPD=NA)	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	5.23	1	4.40	1	4.99	1	4.46	1	2.99	1	3.03 (RPD=1.33)	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.011	1	0.033	1	0.015	1	0.016	1	0.063	1	0.062 (RPD=1.60)	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	0.698	1	2.26	1	0.782	1	1.25	1	3.22	1	3.20 (RPD=0.62)	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1

Comments:

Per the Technical Directive, selective elements with values less than the ICP quantitation limit where analyzed by ICP-MS. Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental and Infrastructure, Inc.

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Sample Results (1, 2)

Analysts:	Steve Markham	Field Sample ID	ML 2-3	ML 2-5	ML 2-6	ML 2-7	ML 3-2	ML 3-4
		Sample Lab ID	4408-17	4408-18	4408-19	4408-20	4408-21	4408-22
Method:	RSKSOP 257(2)	Date Collected	7/17/08	7/17/08	7/17/08	7/17/08	7/17/08	7/18/08
		Date Analyzed	7/28, 7/30 & 8/4/08	7/28, 7/30 & 8/4/08	7/28, 7/30 & 8/4/08	7/28, 7/30 & 8/4/08	7/28, 7/30 & 8/4/08	7/28, 7/30 & 8/4/08

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	30.6	1	2.33	1	2.42	1	4.89	1	19.5	1	8.29	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.164	1	0.512	1	0.370	1	0.267	1	BQL(0.098)	1	0.210	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	2.76	1	BQL(0.239)	1	0.310	1	0.469	1	0.601	1	0.656	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	5.41	1	3.81	1	4.10	1	4.19	1	2.40	1	5.34	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	BQL(0.006)	1	0.056	1	0.174	1	0.695	1	0.033	1	0.009	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	3.45	1	0.387	1	1.36	1	1.83	1	11.3	1	2.09	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:
Per the Technical Directive, selective elements with values less than the ICP quantitation limit were analyzed by ICP-MS. Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: 5ME512SF

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Field Sample ID	ML 3-6	ML 5-3	ML 5-4	ML 5-5	ML 5-5	ML 5-6
Sample Lab ID	4408-23	4408-24	4408-25	4408-26	4408-26 Lab Dup.	4408-27
Date Collected	7/18/08	7/18/08	7/18/08	7/18/08	7/18/08	7/18/08
Date Analyzed	7/28, 7/30 & 8/4/08	7/28, 7/30 & 8/4/08	7/28, 7/30 & 8/4/08	7/28, 8/4 & 8/5/08	7/28, 8/4 & 8/5/08	7/28, 8/4 & 8/5/08

Analytes		Unit	MDL	QL	Data		DF	Data		DF	Data		DF	Data		DF	Data		DF
Names	Codes																		
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	0.857	1	—	—	1.06	1	1.24	1	1.31 (RPD=5.49)	1	1.39	1			
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.115	1	0.470	1	0.599	1	0.602	1	0.580 (RPD=3.72)	1	0.546	1			
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	BQL(0.184)	1	0.592	1	BQL(0.177)	1	BQL(0.196)	1	BQL(0.201) (RPD=NA)	1	0.299	1			
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—			
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1			
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	5.30	1	6.13	1	4.44	1	4.33	1	4.24 (RPD=2.10)	1	4.57	1			
Uranium (U)	7440-61-1	µg/L	0.002	0.007	BQL(0.002)	1	BQL(0.003)	1	BQL(0.003)	1	BQL(0.004)	1	BQL(0.003) RPD=NA)	1	ND	1			
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	2.16	1	0.678	1	BQL(0.176)	1	ND	1	ND (RPD=NA)	1	ND	1			
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1			

Comments:
Per the Technical Directive, selective elements with values less than the ICP quantitation limit where analyzed by ICP-MS. Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental and Infrastructure, Inc.

Analytical Service Results Report

Laboratory: Metals Report Date: 8/8/08

Technical Directive: 5ME512SF

Sample Results (1, 2)

Analysts:	Steve Markham		Field Sample ID		ML 5-7		FIELD BLANK		ML 6-3		ML 6-4		ML 6-5		ML 6-6		
	RSKSOP 257(2)		Sample Lab ID		4408-28		4408-29		4408-30		4408-31		4408-32		4408-33		
			Date Collected		7/18/08		7/19/08		7/19/08		7/19/08		7/19/08		7/19/08		
			Date Analyzed		7/28, 8/4 & 8/5/08		7/28, 7/30 & 8/4/08		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08		
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																
Arsenic (As)		7440-38-2	µg/L	0.014	0.047	2.08	1	ND	1	—	—	1.90	1	3.29	1	5.39	1
Chromium (Cr)		7440-47-3	µg/L	0.030	0.100	0.261	1	ND	1	0.751	1	0.634	1	0.686	1	0.604	1
Copper (Cu)		7440-50-8	µg/L	0.072	0.240	0.504	1	ND	1	0.819	1	0.431	1	0.539	1	0.537	1
Iron (Fe)		7439-89-6	µg/L	0.289	0.964	—	—	ND	1	—	—	—	—	—	—	—	—
Lead (Pb)		7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Selenium (Se)		7782-49-2	µg/L	0.169	0.564	4.44	1	ND	1	6.16	1	4.88	1	4.70	1	4.97	1
Uranium (U)		7440-61-1	µg/L	0.002	0.007	0.113	1	ND	1	ND	1	BQL(0.005)	1	BQL(0.004)	1	BQL(0.004)	1
Zinc (Zn)		7440-66-6	µg/L	0.079	0.264	ND	1	ND	1	0.559	1	ND	1	ND	1	0.266	1
Mercury (Hg)		7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:
Per the Technical Directive, selective elements with values less than the ICP quantitation limit where analyzed by ICP-MS. Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental and Infrastructure, Inc.

Analytical Service Results Report

Laboratory: **Metals** Report Date: **8/8/08**

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Technical Directive: **5ME512SF**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(2)**

Field Sample ID	ML 6-7	ML 7-4	ML 7-5	ML 7-6	ML 7-6	ML 7-7
Sample Lab ID	4408-34	4408-35	4408-36	4408-37	4408-37 Lab Dup.	4408-38
Date Collected	7/19/08	7/19/08	7/19/08	7/19/08	7/19/08	7/19/08
Date Analyzed	7/28, 8/4 & 8/5/08	7/28, 8/4 & 8/5/08	7/28, 8/4 & 8/5/08	7/28, 8/4 & 8/5/08	7/28, 8/4 & 8/5/08	7/28, 8/4 & 8/5/08

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	3.01	1	2.90	1	4.23	1	3.72	1	3.65 (RPD=1.90)	1	3.18	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.256	1	0.755	1	0.729	1	0.336	1	0.347 (RPD=3.22)	1	0.257	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.619	1	0.723	1	0.845	1	1.80	1	1.78 (RPD=1.12)	1	1.33	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	4.90	1	5.21	1	5.88	1	5.23	1	5.50 (RPD=5.03)	1	5.06	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.041	1	BQL(0.004)	1	BQL(0.005)	1	ND	1	ND (RPD=NA)	1	BQL(0.007)	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	ND	1	BQL(0.209)	1	BQL(0.097)	1	2.57	1	2.49 (RPD=3.16)	1	0.522	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1

Comments:
Per the Technical Directive, selective elements with values less than the ICP quantitation limit where analyzed by ICP-MS. Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applical Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental and Infrastructure, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 8/8/08

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Technical Directive: 5ME512SF

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Analysts:	Steve Markham		Field Sample ID		ML 4-3		ML 4-4		ML 4-5		ML 4-6		ML 4-7		ML 3-5		
	Sample Lab ID				4408-39		4408-40		4408-41		4411-01		4411-02		4411-03		
Method:	RSKSOP 257(2)		Date Collected		7/21/08		7/21/08		7/21/08		7/21/08		7/21/08		7/21/08		
			Date Analyzed		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08		
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes																
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	—	—	3.79	1	2.29	1	1.61	1	1.46	1	1.73	1	
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.582	1	0.560	1	0.425	1	0.391	1	0.316	1	BQL(0.096)	1	
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.428	1	0.243	1	0.327	1	0.296	1	0.583	1	0.940	1	
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—	
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	5.69	1	4.79	1	4.22	1	4.23	1	4.37	1	6.62	1	
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.301	1	0.058	1	0.127	1	0.012	1	0.171	1	0.025	1	
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	0.358	1	ND	1	BQL(0.188)	1	0.467	1	0.549	1	2.03	1	
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	

Comments:
Per the Technical Directive, selective elements with values less than the ICP quantitation limit where analyzed by ICP-MS. Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

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Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental and Infrastructure, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 8/8/08

Technical Directive: 5ME512SF

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Field Sample ID	ML 3-7	ML 2-4	ML 1-3	ML 1-3	ML 1-5	ML 1-7
Sample Lab ID	4411-04	4411-05	4411-06	4411-06 Lab Dup.	4411-07	4411-08
Date Collected	7/21/08	7/21/08	7/22/08	7/22/08	7/22/08	7/22/08
Date Analyzed	7/28, 8/4 & 8/5/08	7/28, 8/4 & 8/5/08	7/28, 8/4 & 8/5/08	7/28, 8/4 & 8/5/08	7/28, 8/4 & 8/5/08	7/28, 8/4 & 8/5/08

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	5.36	1	5.42	1	10.5	1	10.4 (RPD=0.96)	1	1.39	1	1.14	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.161	1	0.708	1	0.333	1	0.299 (RPD=10.76)	1	0.296	1	0.155	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	BQL(0.217)	1	0.958	1	0.444	1	0.421 (RPD=5.32)	1	0.294	1	0.271	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND (RPD=NA)	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	4.07	1	6.57	1	5.13	1	4.81 (RPD=6.44)	1	3.48	1	3.06	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.147	1	0.008	1	0.033	1	0.034 (RPD=2.99)	1	0.032	1	0.015	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	1.12	1	0.285	1	ND	1	ND (RPD=NA)	1	0.781	1	1.87	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	BQL(0.022)	1	BQL(0.025) (RPD=NA)	1	ND	1	BQL(0.024)	1

Comments:
Per the Technical Directive, selective elements with values less than the ICP quantitation limit where analyzed by ICP-MS. Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

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Shaw Environmental and Infrastructure, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 8/8/08

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Technical Directive: 5ME512SF

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Analysts:	Steve Markham		Field Sample ID		ML 2-2		ML 3-3		ML 5-2		ML 6-2		ML 7-2		ML 4-2	
	RSKSOP 257(2)				Sample Lab ID		4411-09		4411-10		4411-11		4411-12		4411-13	
Method:			Date Collected		7/22/08		7/22/08		7/22/08		7/23/08		7/23/08		7/23/08	
			Date Analyzed		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08	
Analytes		Unit	MDL	QL	Data		DF	Data		DF	Data		DF	Data		DF
Names	Codes				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	8.43	1	6.60	1	16.4	1	8.88	1	6.16	1	17.7	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.272	1	ND	1	0.715	1	0.393	1	0.677	1	0.718	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.814	1	2.61	1	0.991	1	0.856	1	2.54	1	1.10	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	6.08	1	8.20	1	6.00	1	4.91	1	7.59	1	6.79	1
Uranium (U)	7440-61-1	µg/L	0.002	0.007	BQL(0.004)	1	ND	1	0.008	1	BQL(0.003)	1	BQL(0.003)	1	0.052	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	3.09	1	5.34	1	3.15	1	1.20	1	1.88	1	2.94	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:
Per the Technical Directive, selective elements with values less than the ICP quantitation limit where analyzed by ICP-MS. Chromium, iron and selenium were analyzed using the Collision Cell Technology (CCT) to reduce the interferences of the polyatomic species.

Notes:

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Shaw Environmental and Infrastructure, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 8/8/08

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Technical Directive: 5ME512SF

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Analysts:	Steve Markham		Field Sample ID		ML 7-3		DUPLICATE 2										
			Sample Lab ID		4411-15		4411-16										
Method:	RSKSOP 257(2)		Date Collected		7/23/08		7/21/08										
			Date Analyzed		7/28, 8/4 & 8/5/08		7/28, 8/4 & 8/5/08										
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names		Codes															
Arsenic (As)		7440-38-2	µg/L	0.014	0.047	—	—	4.79	1								
Chromium (Cr)		7440-47-3	µg/L	0.030	0.100	0.590	1	0.596	1								
Copper (Cu)		7440-50-8	µg/L	0.072	0.240	1.26	1	0.970	1								
Iron (Fe)		7439-89-6	µg/L	0.289	0.964	—	—	—	—								
Lead (Pb)		7439-92-1	µg/L	0.025	0.084	ND	1	ND	1								
Selenium (Se)		7782-49-2	µg/L	0.169	0.564	7.07	1	6.12	1								
Uranium (U)		7440-61-1	µg/L	0.002	0.007	BQL(0.007)	1	0.008	1								
Zinc (Zn)		7440-66-6	µg/L	0.079	0.264	1.41	1	0.965	1								
Mercury (Hg)		7439-97-6	µg/L	0.017	0.057	ND	1	ND	1								

Comments:
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EPA - General Parameters

Analytical Results Report

Laboratory:

General Parameters

Report Date:

08/13/08

Technical Directive:

EPAGP038

Analyst:

Kristie Hargrove

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)			
				Codes	7440-44-0-TIC	7440-44-0-TOC			
				Methods	RSKSOP-265 Rev. 3	RSKSOP-265 Rev. 3			
				Unit	mg/L	mg/L			
				MDL	0.024**	0.040**			
				QL	0.100**	0.100**			
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF		
PMW-3	4408-7	7/16/2008	8/4-8/11/2008	55.9 (± 0.1008)	8	18.9 (± 0.0125)	10		
PMW-2	4408-8	7/16/2008	8/4-8/11/2008	54.4 (± 0.0928)	8	14.7 (± 0.0132)	4		
PMW-1	4408-9	7/16/2008	8/4-8/11/2008	71.2 (± 0.0978)	8	45.0 (± 0.0900)	8		
PMW-6	4408-10	7/16/2008	8/4-8/11/2008	64.4 (± 0.0396)	8	15.4 (± 0.0186)	4		
DUPLICATE 1	4408-11	7/16/2008	8/4-8/11/2008	54.2 (± 0.0595)	8	18.8 (± 0.0495)	4		
PMW-5	4408-12	7/16/2008	8/4-8/11/2008	33.6 (± 0.0696)	8	148 (± 0.0229)	20		
PMW-4	4408-13	7/16/2008	8/4-8/11/2008	49.2 (± 0.0346)	8	18.8 (± 0.0112)	4		
ML 1-2	4408-14	7/17/2008	8/4-8/11/2008	97.5 (± 0.1837)	8	34.7 (± 0.0840)	4		
ML 1-4	4408-15	7/17/2008	8/4-8/11/2008	59.5 (± 0.0756)	8	21.6 (± 0.1038)	4		
ML 1-6	4408-16	7/17/2008	8/4-8/11/2008	54.9 (± 0.0545)	8	8.33 (± 0.0507)	4		
ML 1-6	4408-16 Lab Dup	7/17/2008	8/4-8/11/2008	55.0 (± 0.0728) (RPD=0.182)	8	8.18 (± 0.0095) (RPD=1.82)	4		
ML 2-3	4408-17	7/17/2008	8/4-8/11/2008	4.82 (± 0.0087)	4	1,010 (± 0.1108)	101		
ML 2-5	4408-18	7/17/2008	8/4-8/11/2008	50.5 (± 0.0338)	8	15.5 (± 0.0617)	4		
ML 2-6	4408-19	7/17/2008	8/4-8/11/2008	65.1 (± 0.0887)	8	12.5 (± 0.0117)	4		
ML 2-7	4408-20	7/17/2008	8/4-8/11/2008	81.2 (± 0.1421)	8	15.1 (± 0.0436)	4		
ML 3-2	4408-21	7/17/2008	8/4-8/11/2008	24.9 (± 0.0360)	4	1,490 (± 0.1154)	101		
ML 3-4	4408-22	7/18/2008	8/4-8/11/2008	41.8 (± 0.1166)	4	428 (± 0.0762)	40		
ML 3-6	4408-23	7/18/2008	8/4-8/11/2008	145 (± 0.1908)	8	37.8 (± 0.0712)	20		
ML 5-3	4408-24	7/18/2008	8/4-8/11/2008	80.9 (± 0.0682)	8	83.5 (± 0.0702)	10		
ML 5-4	4408-25	7/18/2008	8/4-8/11/2008	55.3 (± 0.0115)	8	18.5 (± 0.0554)	8		
ML 5-5	4408-26	7/18/2008	8/4-8/11/2008	52.7 (± 0.0761)	8	24.6 (± 0.0159)	10		
ML5-5	4408-26 Lab Dup	7/18/2008	8/4-8/11/2008	51.8 (± 0.0298) (RPD=1.72)	8	24.3 (± 0.0113) (RPD=1.23)	10		
ML 5-6	4408-27	7/18/2008	8/4-8/11/2008	65.2 (± 0.0717)	8	29.8 (± 0.0106)	20		
ML 5-7	4408-28	7/18/2008	8/4-8/11/2008	94.3 (± 0.1779)	8	14.6 (± 0.0496)	4		
FIELD BLANK	4408-29	7/19/2008	8/4-8/11/2008	0.396 (± 0.0623)	1	0.111 (± 0.0065)	1		
ML 6-3	4408-30	7/19/2008	8/4-8/11/2008	73.1 (± 0.0333)	8	150 (± 0.0654)	8		
ML 6-4	4408-31	7/19/2008	8/4-8/11/2008	44.3 (± 0.0628)	8	135 (± 0.0874)	10		
ML 6-5	4408-32	7/19/2008	8/4-8/11/2008	24.0 (± 0.0270)	8	183 (± 0.0875)	10		
ML 6-6	4408-33	7/19/2008	8/4-8/11/2008	41.1 (± 0.1054)	4	150 (± 0.0922)	10		
ML 6-7	4408-34	7/19/2008	8/4-8/11/2008	74.7 (± 0.0685)	8	54.4 (± 0.2639)	4		
ML 7-4	4408-35	7/19/2008	8/4-8/11/2008	57.5 (± 0.0524)	4	158 (± 0.0232)	20		
ML 7-5	4408-36	7/19/2008	8/4-8/11/2008	28.3 (± 0.0369)	4	332 (± 0.0618)	20		
ML 7-5	4408-36 Lab Dup	7/19/2008	8/4-8/11/2008	-	-	330 (± 0.0936) (RPD=0.604)	20		
ML 7-6	4408-37	7/19/2008	8/4-8/11/2008	40.6 (± 0.0451)	4	374 (± 0.1840)	20		
ML 7-6	4408-37	7/19/2008	8/4-8/11/2008	40.4 (± 0.0384) (RPD = 0.494)	4	-	-		
ML 7-7	4408-38	7/19/2008	8/4-8/11/2008	72.7 (± 0.1498)	4	238 (± 0.0985)	20		

EPA - General Parameters

Analytical Results Report

Laboratory:

General Parameters

Report Date:

08/13/08

Technical Directive:

EPAGP038

Analyst:

Kristie Hargrove

Analyst:	Kristie Hargrove		Analyses	Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)			
			Codes	7440-44-0-TIC		7440-44-0-TOC			
			Methods	RSKSOP-265 Rev. 3		RSKSOP-265 Rev. 3			
			Unit	mg/L		mg/L			
			MDL	0.024**		0.040**			
			QL	0.100**		0.100**			
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF		
ML 4-3	4408-39	7/21/2008	8/4-8/11/2008	76.3 (± 0.1289)	8	33.3 (± 0.0241)	8		
ML 4-4	4408-40	7/21/2008	8/4-8/11/2008	70.4 (± 0.1117)	8	22.5 (± 0.0140)	8		
ML4-4	4408-40 Lab Dup	7/21/2008	8/4-8/11/2008	-	-	22.2 (± 0.0127) (RPD=0.1.34)	8		
ML 4-5	4408-41	7/21/2008	8/4-8/11/2008	70.7 (± 0.1224)	8	21.0 (± 0.0235)	4		
ML 4-6	4411-1	7/21/2008	8/4-8/11/2008	61.2 (± 0.0664)	8	15.0 (± 0.0435)	4		
ML 4-7	4411-2	7/21/2008	8/4-8/11/2008	93.5 (± 0.0815)	8	13.3 (± 0.0165)	4		
ML 3-5	4411-3	7/21/2008	8/4-8/11/2008	148 (± 0.0759)	8	206 (± 0.0313)	101		
ML 3-7	4411-4	7/21/2008	8/4-8/11/2008	71.3 (± 0.0929)	8	7.64 (± 0.0307)	4		
ML 2-4	4411-5	7/21/2008	8/4-8/11/2008	62.6 (± 0.0825)	4	159 (± 0.0127)	10		
ML 1-3	4411-6	7/22/2008	8/4-8/11/2008	90.6 (± 0.1366)	8	30.7 (± 0.0492)	4		
ML 1-5	4411-7	7/22/2008	8/4-8/11/2008	84.0 (± 0.1120)	8	18.3 (± 0.0407)	4		
ML 1-7	4411-8	7/22/2008	8/4-8/11/2008	88.6 (± 0.0941)	8	10.9 (± 0.0426)	4		
ML 1-7	4411-8 Lab Dup	7/22/2008	8/4-8/11/2008	87.0 (± 0.0918)(RPD=1.82)	8	10.8 (± 0.0070) (RPD=0.922)	4		
ML 2-2	4411-9	7/22/2008	8/4-8/11/2008	39.2 (± 0.1200)	4	388 (± 0.2016)	20		
ML 3-3	4411-10	7/22/2008	8/4-8/11/2008	32.5 (± 0.0343)	4	1,870 (± 0.0393)	101		
ML 5-2	4411-11	7/22/2008	8/4-8/11/2008	52.1 (± 0.0175)	8	213 (± 0.0508)	20		
ML 6-2	4411-12	7/23/2008	8/4-8/11/2008	48.1 (± 0.0166)	8	366 (± 0.0450)	20		
ML 7-2	4411-13	7/23/2008	8/4-8/11/2008	5.13 (± 0.0166)	2	2,450 (± 0.0319)	201		
ML 4-2	4411-14	7/23/2008	8/4-8/11/2008	68.0 (± 0.0121)	8	570 (± 0.0521)	101		
ML 7-3	4411-15	7/23/2008	8/4-8/11/2008	34.6 (± 0.0222)	8	994 (± 0.0755)	101		
ML 7-3	4411-15 Lab Dup	7/23/2008	8/4-8/11/2008	-	-	983 (± 0.0516)(RPD=1.11)	101		
DUPLICATE 2	4411-16	7/21/2008	8/4-8/11/2008	54.7 (± 0.0264)	8	154 (± 0.0116)	20		

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set. The samples were diluted to accommodate the wide range of concentrations in the sample sets. The data values are reported with the dilution factors applied. MDL studies have been performed for the Phoenix 8000. The current MDL value is 0.024 mg/L for TIC range 0.1-20 mg/L performed on 11/19/2007, and 0.040 mg/L for TOC range 0.1-20 mg/L performed on 11/16/2007. ** The MDL and QL should be raised by the same factor as the dilution factor in the samples that were diluted.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (**DF**), if applicable.
2. " - " denotes that the information is not available or the analyte is not analyzed.

EPA - General Parameters

Analytical Results Report

Laboratory:

General Parameters

Work Request:

EPAGP038

Sample Results

Analyst:

Lynda Callaway

Report Date:

08/14/08

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Analytes		Chloride (Cl)		Bromide (Br)		Sulfate (as SO ₄)		Fluoride (F)	
				Codes		16887-00-6		7726-95-6-BR		14808-79-8		7782-41-4	
				Methods		RSKSOP-288/2		RSKSOP-288/2		RSKSOP-288/2		RSKSOP-288/2	
				Unit		mg/L		mg/L		mg/L		mg/L	
				MDL		* 0.259		0.297		0.388		0.044	
				QL		* 1.00		1.00		1.00		0.200	
				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
PMW-3	4408-7	7/16/2008	7/24 - 7/25/08	48.1	2	BQL (0.903)	1	14.5	1	BQL (0.168)	1		
PMW-2	4408-8	7/16/2008	7/24 - 7/25/08	25.4	1	BQL (0.533)	1	35.1	1	BQL (0.182)	1		
PMW-1	4408-9	7/16/2008	7/24 - 7/25/08	70.5	2	ND	1	10.8	1	BQL (0.106)	1		
PMW-6	4408-10	7/16/2008	7/24 - 7/25/08	34.0	1	BQL (0.688)	1	5.05	1	BQL (0.154)	1		
Duplicate 1	4408-11	7/16/2008	7/24 - 7/25/08	47.3	1	BQL (0.511)	1	15.1	1	BQL (0.138)	1		
PMW-5	4408-12	7/16/2008	7/24 - 7/25/08	195	6	BQL (0.765)	1	BQL (0.993)	1	BQL (0.079)	1		
PMW-4	4408-13	7/16/2008	7/24 - 7/25/08	34.1	1	BQL (0.985)	1	38.7	1	0.226	1		
ML 1-2	4408-14	7/17/2008	7/24 - 7/25/08	86.3	6	1.04	1	16.7	1	0.207	1		
ML 1-4	4408-15	7/17/2008	7/24 - 7/25/08	35.7	1	1.05	1	47.2	1	0.312	1		
ML 1-6	4408-16	7/17/2008	7/24 - 7/25/08	96.8	6	BQL (0.489)	1	31.8	1	0.332	1		
ML 2-3	4408-17	7/17/2008	7/24 - 7/25/08	862	21	ND	1	1.10	1	0.239	1		
ML 2-5	4408-18	7/17/2008	7/24 - 7/25/08	34.3	1	BQL (0.693)	1	37.1	1	0.237	1		
ML 2-6	4408-19	7/17/2008	7/24 - 7/25/08	48.8	1	BQL (0.770)	1	36.0	1	0.272	1		
ML 2-7	4408-20	7/17/2008	7/24 - 7/25/08	98.4	6	BQL (0.808)	1	31.8	1	0.374	1		
ML 3-2	4408-21	7/17/2008	7/24 - 7/25/08	111	6	BQL (0.982)	1	1.68	1	BQL (0.176)	1		
ML 3-2	4408-21 Lab dup	7/17/2008	7/24 - 7/25/08	110 (RPD=0.905)	6	BQL (0.719)(RPD=NA)	1	1.64 (RPD=2.41)	1	BQL (0.171) (RPD=NA)	1		
ML 3-4	4408-22	7/18/2008	7/24 - 7/25/08	27.8	1	BQL (0.586)	1	2.02	1	0.221	1		
ML 3-6	4408-23	7/18/2008	7/24 - 7/25/08	94.9	6	1.23	1	BQL (0.397)	1	0.217	1		
ML 5-3	4408-24	7/18/2008	7/24 - 7/25/08	248	6	BQL (0.570)	1	ND	1	0.327	1		
ML 5-4	4408-25	7/18/2008	7/24 - 7/25/08	35.9	1	1.17	1	39.2	1	BQL (0.185)	1		
ML 5-5	4408-26	7/18/2008	7/24 - 7/25/08	61.4	6	BQL (0.581)	1	18.6	1	0.217	1		
ML 5-6	4408-27	7/18/2008	7/24 - 7/25/08	106	6	1.03	1	1.84	1	0.246	1		
ML 5-7	4408-28	7/18/2008	7/24 - 7/25/08	136	6	BQL (0.641)	1	ND	1	0.346	1		
Field Blank	4408-29	7/19/2008	7/24 - 7/25/08	ND	1	ND	1	ND	1	ND	1		
ML 6-3	4408-30	7/19/2008	7/24 - 7/25/08	174	6	1.01	1	ND	1	0.299	1		
ML 6-3	4408-30 Lab dup	7/19/2008	7/24 - 7/25/08	171 (RPD=1.74)	6	1.07 (RPD=5.77)	1	ND (RPD=NA)	1	0.280 (RPD=6.56)	1		
ML 6-4	4408-31	7/19/2008	7/24 - 7/25/08	61.1	6	BQL (0.657)	1	ND	1	BQL (0.169)	1		
ML 6-5	4408-32	7/19/2008	7/24 - 7/25/08	169	6	BQL (0.681)	1	ND	1	BQL (0.128)	1		
ML 6-6	4408-33	7/19/2008	7/24 - 7/25/08	187	6	BQL (0.653)	1	ND	1	BQL (0.135)	1		
ML 6-7	4408-34	7/19/2008	7/24 - 7/25/08	182	6	BQL (0.583)	1	ND	1	0.393	1		
ML 7-4	4408-35	7/19/2008	7/24 - 7/25/08	157	6	BQL (0.670)	1	ND	1	BQL (0.158)	1		
ML 7-5	4408-36	7/19/2008	7/24 - 7/25/08	272	6	BQL (0.688)	1	BQL (0.399)	1	ND	1		
ML 7-6	4408-37	7/19/2008	7/24 - 7/25/08	205	6	BQL (0.665)	1	ND	1	BQL (0.181)	1		
ML 7-7	4408-38	7/19/2008	7/24 - 7/25/08	179	6	BQL (0.547)	1	ND	1	0.306	1		
ML 4-3	4408-39	7/21/2008	7/24 - 7/25/08	139	6	ND	1	ND	1	0.251	1		
ML 4-4	4408-40	7/21/2008	7/24 - 7/25/08	28.3	1	BQL (0.872)	1	ND	1	0.226	1		

EPA - General Parameters**Analytical Results Report**

Laboratory:

General Parameters

Work Request:

EPAGP038

Sample Results

Analyst:

Lynda Callaway

Report Date:

08/14/08

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Analytes		Chloride (Cl)		Bromide (Br)		Sulfate (as SO ₄)		Fluoride (F)	
				Codes		16887-00-6		7726-95-6-BR		14808-79-8		7782-41-4	
				Methods		RSKSOP-288/2		RSKSOP-288/2		RSKSOP-288/2		RSKSOP-288/2	
				Unit		mg/L		mg/L		mg/L		mg/L	
				MDL		* 0.259		0.297		0.388		0.044	
				QL		* 1.00		1.00		1.00		0.200	
				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
ML 4-5	4408-41	7/21/2008	7/24 - 7/25/08	42.9	1	BQL (0.492)	1	ND	1	0.274	1		
ML 4-5	4408-41 Lab dup	7/21/2008	7/24 - 7/25/08	41.9 (RPD=2.36)	1	BQL (0.497) (RPD=NA)	1	ND (RPD=NA)	1	0.282 (RPD=2.88)	1		
ML 4-6	4411-1	7/21/2008	8/4 - 8/6/08	67.0	6	BQL (0.417)	1	ND	1	BQL (0.190)	1		
ML 4-7	4411-2	7/21/2008	8/4 - 8/6/08	91.4	6	BQL (0.397)	1	ND	1	0.224	1		
ML 3-5	4411-3	7/21/2008	8/4 - 8/6/08	32.1	1	BQL (0.343)	1	ND	1	BQL (0.116)	1		
ML 3-7	4411-4	7/21/2008	8/4 - 8/6/08	132	6	ND	1	BQL (0.928)	1	BQL (0.154)	1		
ML 2-4	4411-5	7/21/2008	8/4 - 8/6/08	208	6	BQL (0.612)	1	2.06	1	BQL (0.073)	1		
ML 1-3	4411-6	7/22/2008	8/4 - 8/6/08	36.1	1	ND	1	19.9	1	0.223	1		
ML 1-5	4411-7	7/22/2008	8/4 - 8/6/08	18.8	1	ND	1	17.2	1	BQL (0.143)	1		
ML 1-7	4411-8	7/22/2008	8/4 - 8/6/08	129	6	ND	1	2.71	1	0.203	1		
ML 1-7	4411-8 Lab dup	7/22/2008	8/4 - 8/6/08	130 (RPD=0.772)	6	ND (RPD=NA)	1	2.72 (RPD=0.368)	1	BQL (0.199) (RPD=NA)	1		
ML 2-2	4411-9	7/22/2008	8/4 - 8/6/08	574	21	ND	1	ND	1	ND	1		
ML 3-3	4411-10	7/22/2008	8/4 - 8/6/08	92.3	6	BQL (0.698)	1	BQL (0.875)	1	ND	1		
ML 5-2	4411-11	7/22/2008	8/4 - 8/6/08	413	21	BQL (0.394)	1	ND	1	BQL (0.069)	1		
ML 6-2	4411-12	7/23/2008	8/4 - 8/6/08	293	21	BQL (0.304)	1	ND	1	0.210	1		
ML 7-2	4411-13	7/23/2008	8/4 - 8/6/08	367	21	BQL (0.818)	1	1.05	1	BQL (0.077)	1		
ML 4-2	4411-14	7/23/2008	8/4 - 8/6/08	369	21	1.05	1	BQL (0.410)	1	BQL (0.097)	1		
ML 7-3	4411-15	7/23/2008	8/4 - 8/6/08	235	21	BQL (0.463)	1	ND	1	BQL (0.123)	1		
Duplicate 2	4411-16	7/21/2008	8/4 - 8/6/08	225	21	BQL (0.717)	1	1.85	1	BQL (0.150)	1		
Duplicate 2	4411-16 Lab dup	7/21/2008	8/4 - 8/6/08	219 (RPD=2.70)	21	BQL (0.723) (RPD=NA)	1	1.91 (RPD=3.19)	1	BQL (0.153) (RPD=NA)	1		

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set within the calibration range. *MDL and QL should be raised by the same factor as the dilution factor for those samples that were diluted. The MDLs were determined on 8/7/2008.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (**DF**), if applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Chunming Su VOC samples for d37Cl
+/- 0.20 permill

Lab ID	Sample ID	d37Cl
J-818	PMW-3	-
J-819	PMW-5	2.8
J-820	ML-2-3	-
J-821	ML-2-5	3.8
J-822	Duplicate-1	-
J-823	ML-5-3	4.2
J-824	ML-5-5	3.2

Shaw Environmental and Infrastructure, Inc.
Analytical Service Results Report

Laboratory:

Metals

 Report Date:

3/24/09

Page 1 of 10

Technical Directive:

5ME566SF

Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analysts:	Sandra Saye		Field Sample ID			PMW-3		PMW-3		PMW-2		Field Blank		PMW-1		DUP-1	
			Sample Lab ID			4732-01		4732-01 Lab Dup		4732-02		4732-03		4732-04		4732-05	
			Date Collected			3/4/09		3/4/09		3/4/09		3/4/09		3/4/09		3/4/09	
			Date Analyzed			3/12/09		3/12/09		3/12/09		3/12/09		3/12/09		3/12/09	
Method:	RSKSOP 213(3)																
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Aluminum (Al)	7429-90-5	mg/L	0.034	0.111	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND	1	ND(RPD=NA)	1	ND	1	BQL(0.007)	1	ND	1	ND	1	
Boron (B)	7440-42-8	mg/L	0.003	0.010	0.161	1	0.160(RPD=0.62)	1	0.106	1	ND	1	ND	1	ND	1	
Barium (Ba)	7440-39-3	mg/L	0.002	0.007	0.032	1	0.032(RPD=0.00)	1	0.029	1	ND	1	0.089	1	0.094	1	
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Calcium (Ca)	7440-70-2	mg/L	0.255	0.851	24.8	1	24.8(RPD=0.00)	1	53.0	1	ND	1	88.5	1	93.0	1	
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	BQL(0.003)	1	BQL(0.002)	1	
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Copper (Cu)	7440-50-8	mg/L	0.004	0.013	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Iron (Fe)	7439-89-6	mg/L	0.026	0.087	15.7	1	15.7(RPD=0.00)	1	13.8	1	ND	1	75.8	1	79.6	1	
Potassium (K)	7440-09-7	mg/L	0.047	0.156	2.07	1	2.09(RPD=0.96)	1	2.41	1	BQL(0.093)	1	2.48	1	2.49	1	
Magnesium (Mg)	7439-95-4	mg/L	0.034	0.111	8.28	1	8.30(RPD=0.24)	1	10.7	1	ND	1	10.7	1	11.2	1	
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.112	1	0.110(RPD=1.80)	1	0.139	1	ND	1	0.435	1	0.456	1	
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.006	1	0.006(RPD=0.00)	1	0.012	1	BQL(0.001)	1	0.010	1	0.010	1	
Sodium (Na)	7440-23-5	mg/L	0.061	0.201	56.8	1	56.9(RPD=0.18)	1	49.8	1	BQL(0.106)	1	32.8	1	31.4	1	
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Lead (Pb)	7439-92-1	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.002)(RPD=NA)	1	ND	1	ND	1	0.012	1	0.012	1	
Antimony (Sb)	7440-36-0	mg/L	0.004	0.013	BQL(0.006)	1	BQL(0.005)(RPD=NA)	1	BQL(0.013)	1	ND	1	0.019	1	0.023	1	
Selenium (Se)	7782-49-2	mg/L	0.005	0.015	0.028	1	0.027(RPD=3.64)	1	0.045	1	ND	1	0.061	1	0.066	1	
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.140	1	0.140(RPD=0.00)	1	0.174	1	ND	1	0.360	1	0.377	1	
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Thallium (Tl)	7440-28-0	mg/L	0.005	0.015	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Vanadium (V)	7440-62-2	mg/L	0.003	0.010	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Zinc (Zn)	7440-66-6	mg/L	0.040	0.134	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	ND	1	
Sillicon (Si)	7440-21-3	mg/L	0.186	0.618	17.6	1	17.3(RPD=1.72)	1	12.9	1	ND	1	9.56	1	8.83	1	
Sulfur (S)	7704-34-9	mg/L	0.069	0.228	10.6	1	10.2(RPD=3.85)	1	10.4	1	BQL(0.108)	1	4.17	1	3.77	1	
Phosphorus (P)	7723-14-0	mg/L	0.017	0.056	1.54	1	1.52(RPD=1.31)	1	0.971	1	BQL(0.019)	1	0.688	1	0.613	1	
Uranium (U)	7440-61-1	mg/L	0.004	0.013	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1	BQL(0.005)	1	

Comments:

No problems noted.

Notes:

- If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
- " -" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental and Infrastructure, Inc.

Analytical Service Results Report

Laboratory:

Metals

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Technical Directive:

5ME566SF

Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analytes		Unit	Field Sample ID		PMW-6		PMW-5		DUP-2		PMW-4		ML2-2		ML2-2	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	BQL(0.004)	1	BQL(0.004)	1	ND	1	BQL(0.005)	1	BQL(0.005)(RPD=NA)	1
Aluminum (Al)	7429-90-5	mg/L	0.034	0.111	ND	1	ND	1	ND	1	BQL(0.035)	1	ND	1	ND(RPD=NA)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1
Boron (B)	7440-42-8	mg/L	0.003	0.010	0.128	1	0.041	1	0.032	1	0.091	1	ND	1	ND(RPD=NA)	1
Barium (Ba)	7440-39-3	mg/L	0.002	0.007	0.032	1	0.150	1	0.152	1	0.105	1	0.989	1	0.992(RPD=0.30)	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1
Calcium (Ca)	7440-70-2	mg/L	0.255	0.851	25.6	1	74.5	1	75.5	1	17.3	1	238	1	239(RPD=0.42)	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	0.004	1	0.004	1	BQL(0.001)	1	0.014	1	0.015(RPD=6.90)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1
Copper (Cu)	7440-50-8	mg/L	0.004	0.013	ND	1	BQL(0.005)	1	BQL(0.005)	1	BQL(0.006)	1	0.014	1	BQL(0.013)(RPD=NA)	1
Iron (Fe)	7439-89-6	mg/L	0.026	0.087	14.2	1	125	1	126	1	40.1	1	335	1	336(RPD=0.30)	1
Potassium (K)	7440-09-7	mg/L	0.047	0.156	1.40	1	6.81	1	6.88	1	1.39	1	1.85	1	1.85(RPD=0.00)	1
Magnesium (Mg)	7439-95-4	mg/L	0.034	0.111	5.37	1	14.8	1	15.0	1	10.0	1	115	1	115(RPD=0.00)	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.111	1	0.408	1	0.407	1	0.062	1	1.28	1	1.28(RPD=0.00)	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.006	1	0.009	1	0.008	1	0.005	1	BQL(0.004)	1	BQL(0.004)(RPD=NA)	1
Sodium (Na)	7440-23-5	mg/L	0.061	0.201	50.2	1	57.4	1	57.8	1	54.7	1	128	1	128(RPD=0.00)	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	BQL(0.003)(RPD=NA)	1
Lead (Pb)	7439-92-1	mg/L	0.001	0.004	BQL(0.002)	1	0.021	1	0.020	1	0.008	1	0.056	1	0.059(RPD=5.22)	1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.013	BQL(0.004)	1	0.019	1	0.019	1	ND	1	0.029	1	0.030(RPD=3.39)	1
Selenium (Se)	7782-49-2	mg/L	0.005	0.015	0.033	1	0.044	1	0.046	1	0.025	1	0.055	1	0.056(RPD=1.80)	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.110	1	0.424	1	0.430	1	0.114	1	3.53	1	3.54(RPD=0.28)	1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.015	ND	1	ND	1	ND	1	ND	1	ND	1	BQL(0.005)(RPD=NA)	1
Vanadium (V)	7440-62-2	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1
Zinc (Zn)	7440-66-6	mg/L	0.040	0.134	ND	1	ND	1	ND	1	ND	1	ND	1	ND(RPD=NA)	1
Silicon (Si)	7440-21-3	mg/L	0.186	0.618	17.5	1	17.8	1	17.8	1	13.6	1	7.67	1	7.76(RPD=1.17)	1
Sulfur (S)	7704-34-9	mg/L	0.069	0.228	9.36	1	25.9	1	19.7	1	18.7	1	13.0	1	13.3(RPD=2.28)	1
Phosphorus (P)	7723-14-0	mg/L	0.017	0.056	1.65	1	1.41	1	1.41	1	0.727	1	0.445	1	0.446(RPD=0.22)	1
Uranium (U)	7440-61-1	mg/L	0.004	0.013	ND	1	ND	1	ND	1	ND	1	0.019	1	0.019(RPD=0.00)	1

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. "-" denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental and Infrastructure, Inc.
Analytical Service Results Report

Laboratory: Metals Report Date: 3/24/09

Technical Directive: SME566SF

Sample Results (1, 2)

Analysts: Sandra Saye

Method: RKSOP 213(3)

Analysts:	Sandra Saye		Field Sample ID		ML2-3		ML2-4		ML2-5		ML2-6		ML2-7		ML5-2		
			Sample Lab ID		4732-11		4732-12		4732-13		4732-14		4732-15		4732-16		
	Method:	RSKSOP 213(3)		Date Collected		3/5/09		3/6/09		3/6/09		3/6/09		3/6/09		3/6/09	
				Date Analyzed		3/12/09		3/12/09		3/12/09		3/12/09		3/12/09		3/12/09	
Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	BQL(0.004)	1	
Aluminum (Al)	7429-90-5	mg/L	0.034	0.111	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Boron (B)	7440-42-8	mg/L	0.003	0.010	0.142	1	0.135	1	0.143	1	0.146	1	0.154	1	ND	1	
Barium (Ba)	7440-39-3	mg/L	0.002	0.007	0.498	1	0.404	1	0.031	1	0.028	1	0.054	1	0.271	1	
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Calcium (Ca)	7440-70-2	mg/L	0.255	0.851	111	1	100	1	26.2	1	48.4	1	57.5	1	73.7	1	
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.001)	1	BQL(0.001)	1	ND	1	ND	1	ND	1	0.008	1	
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Copper (Cu)	7440-50-8	mg/L	0.004	0.013	ND	1	ND	1	ND	1	ND	1	ND	1	BQL(0.008)	1	
Iron (Fe)	7439-89-6	mg/L	0.026	0.087	22.8	1	25.1	1	1.73	1	3.81	1	2.98	1	207	1	
Potassium (K)	7440-09-7	mg/L	0.047	0.156	1.24	1	1.17	1	0.720	1	1.10	1	1.45	1	2.52	1	
Magnesium (Mg)	7439-95-4	mg/L	0.034	0.111	20.5	1	20.1	1	2.93	1	5.84	1	5.16	1	41.2	1	
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.507	1	0.436	1	0.124	1	0.185	1	0.309	1	0.291	1	
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.009	1	0.009	1	0.006	1	0.008	1	0.009	1	0.008	1	
Sodium (Na)	7440-23-5	mg/L	0.061	0.201	64.1	1	64.6	1	49.0	1	65.0	1	91.1	1	111	1	
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Lead (Pb)	7439-92-1	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.004)	1	ND	1	ND	1	ND	1	0.031	1	
Antimony (Sb)	7440-36-0	mg/L	0.004	0.013	0.016	1	0.016	1	BQL(0.009)	1	0.015	1	BQL(0.013)	1	0.024	1	
Selenium (Se)	7782-49-2	mg/L	0.005	0.015	0.048	1	0.047	1	0.036	1	0.041	1	0.051	1	0.062	1	
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	1.28	1	1.17	1	0.217	1	0.499	1	0.764	1	0.674	1	
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Thallium (Tl)	7440-28-0	mg/L	0.005	0.015	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Vanadium (V)	7440-62-2	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Zinc (Zn)	7440-66-6	mg/L	0.040	0.134	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	
Silicon (Si)	7440-21-3	mg/L	0.186	0.618	19.5	1	19.5	1	17.8	1	18.0	1	19.4	1	6.00	1	
Sulfur (S)	7704-34-9	mg/L	0.069	0.228	3.25	1	3.72	1	9.86	1	10.1	1	10.1	1	4.71	1	
Phosphorus (P)	7723-14-0	mg/L	0.017	0.056	0.620	1	0.838	1	1.90	1	1.39	1	0.750	1	0.217	1	
Uranium (U)	7440-61-1	mg/L	0.004	0.013	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1	

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Shaw Environmental and Infrastructure, Inc.

Analytical Service Results Report

Laboratory:

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Field Sample ID		ML5-3		DUP-3		ML5-4		ML5-4		ML5-5		ML5-6	
Sample Lab ID		4732-17		4732-18		4732-19		4732-19 Lab Dup		4732-20		4732-21	
Date Collected		3/6/09		3/6/09		3/7/09		3/7/09		3/7/09		3/7/09	
Date Analyzed		3/12/09		3/12/09		3/12/09		3/12/09		3/12/09		3/12/09	
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.003	0.010	BQL(0.003)	1	BQL(0.003)	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
0.034	0.111	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
0.006	0.020	0.178	1	0.182	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
0.003	0.010	ND	1	ND	1	0.161	1	0.163(RPD=1.23)	1	0.153	1	0.153	1
0.002	0.007	0.203	1	0.205	1	0.021	1	0.021(RPD=0.00)	1	0.080	1	0.101	1
0.001	0.004	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
0.255	0.851	84.7	1	85.0	1	22.7	1	22.6(RPD=0.44)	1	35.2	1	41.5	1
0.001	0.004	0.005	1	0.005	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
0.001	0.004	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
0.001	0.004	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
0.004	0.013	BQL(0.005)	1	BQL(0.006)	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
0.026	0.087	147	1	149	1	4.87	1	4.85(RPD=0.41)	1	7.06	1	10.1	1
0.047	0.156	1.29	1	1.34	1	1.20	1	1.21(RPD=0.83)	1	1.26	1	1.28	1
0.034	0.111	48.1	1	47.9	1	8.71	1	8.71(RPD=0.00)	1	7.96	1	7.06	1
0.001	0.004	0.282	1	0.280	1	0.058	1	0.058(RPD=0.00)	1	0.141	1	0.236	1
0.001	0.004	0.010	1	0.010	1	0.005	1	0.005(RPD=0.00)	1	0.006	1	0.007	1
0.061	0.201	73.1	1	74.3	1	54.5	1	54.1(RPD=0.74)	1	54.6	1	66.5	1
0.003	0.010	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
0.001	0.004	0.023	1	0.022	1	BQL(0.002)	1	ND(RPD=NA)	1	ND	1	BQL(0.001)	1
0.004	0.013	0.019	1	0.022	1	BQL(0.005)	1	BQL(0.008)(RPD=NA)	1	BQL(0.008)	1	BQL(0.010)	1
0.005	0.015	0.064	1	0.057	1	0.038	1	0.040(RPD=5.13)	1	0.044	1	0.044	1
0.001	0.004	0.785	1	0.797	1	0.153	1	0.152(RPD=0.66)	1	0.288	1	0.363	1
0.002	0.007	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
0.005	0.015	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
0.003	0.010	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
0.040	0.134	ND	1	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1
0.186	0.618	8.76	1	8.71	1	17.9	1	17.9(RPD=0.00)	1	18.4	1	19.3	1
0.069	0.228	2.57	1	2.15	1	2.83	1	2.85(RPD=0.70)	1	2.46	1	1.72	1
0.017	0.056	0.717	1	0.711	1	1.50	1	1.51(RPD=0.66)	1	1.42	1	1.30	1
0.004	0.013	BQL(0.007)	1	BQL(0.007)	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Shaw Environmental and Infrastructure, Inc.

Analytical Service Results Report

Laboratory:

Metals

Report Date:

3/24/09

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Technical Directive:

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analysts:	Sandra Saye		Field Sample ID		ML5-7		ML1-2		ML1-3		ML1-4		ML1-5		ML1-6		
			Sample Lab ID		4732-22		4732-23		4732-24		4732-25		4732-26		4732-27		
Method:	RSKSOP 213(3)		Date Collected		3/7/09		3/7/09		3/7/09		3/9/09		3/9/09		3/9/09		
			Date Analyzed		3/12/09		3/12/09		3/12/09		3/12/09		3/12/09		3/12/09		
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names		Codes															
Silver (Ag)		7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Aluminum (Al)		7429-90-5	mg/L	0.034	0.111	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Arsenic (As)		7440-38-2	mg/L	0.006	0.020	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Boron (B)		7440-42-8	mg/L	0.003	0.010	0.142	1	0.018	1	0.082	1	0.144	1	0.149	1	0.150	1
Barium (Ba)		7440-39-3	mg/L	0.002	0.007	0.235	1	0.255	1	0.241	1	0.131	1	0.190	1	0.026	1
Beryllium (Be)		7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)		7440-70-2	mg/L	0.255	0.851	63.2	1	84.6	1	58.7	1	42.8	1	49.6	1	25.2	1
Cadmium (Cd)		7440-43-9	mg/L	0.001	0.004	ND	1	BQL(0.002)	1	BQL(0.001)	1	ND	1	ND	1	ND	1
Cobalt (Co)		7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)		7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)		7440-50-8	mg/L	0.004	0.013	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)		7439-89-6	mg/L	0.026	0.087	8.56	1	68.7	1	28.6	1	9.74	1	6.06	1	5.36	1
Potassium (K)		7440-09-7	mg/L	0.047	0.156	1.47	1	3.81	1	2.08	1	1.22	1	1.28	1	1.16	1
Magnesium (Mg)		7439-95-4	mg/L	0.034	0.111	8.15	1	15.7	1	19.0	1	9.66	1	5.95	1	5.27	1
Manganese (Mn)		7439-96-5	mg/L	0.001	0.004	0.382	1	0.640	1	0.240	1	0.168	1	0.254	1	0.133	1
Molybdenum (Mo)		7439-98-7	mg/L	0.001	0.004	0.009	1	0.010	1	0.008	1	0.008	1	0.007	1	0.006	1
Sodium (Na)		7440-23-5	mg/L	0.061	0.201	102	1	63.7	1	74.8	1	65.7	1	67.7	1	125	1
Nickel (Ni)		7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)		7439-92-1	mg/L	0.001	0.004	ND	1	0.009	1	BQL(0.002)	1	ND	1	ND	1	ND	1
Antimony (Sb)		7440-36-0	mg/L	0.004	0.013	BQL(0.012)	1	0.016	1	0.015	1	BQL(0.009)	1	BQL(0.011)	1	BQL(0.006)	1
Selenium (Se)		7782-49-2	mg/L	0.005	0.015	0.058	1	0.067	1	0.064	1	0.051	1	0.045	1	0.042	1
Strontium (Sr)		7440-24-6	mg/L	0.001	0.004	0.659	1	0.477	1	0.677	1	0.535	1	0.751	1	0.137	1
Titanium (Ti)		7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)		7440-28-0	mg/L	0.005	0.015	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Vanadium (V)		7440-62-2	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Zinc (Zn)		7440-66-6	mg/L	0.040	0.134	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Silicon (Si)		7440-21-3	mg/L	0.186	0.618	19.6	1	6.53	1	9.31	1	15.8	1	16.3	1	19.4	1
Sulfur (S)		7704-34-9	mg/L	0.069	0.228	0.840	1	12.6	1	4.58	1	10.9	1	10.1	1	9.18	1
Phosphorus (P)		7723-14-0	mg/L	0.017	0.056	0.915	1	0.083	1	0.340	1	1.16	1	1.13	1	2.38	1
Uranium (U)		7440-61-1	mg/L	0.004	0.013	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Field Sample ID		ML1-7		ML7-2		ML7-2		ML7-3		ML7-4		ML7-5	
Sample Lab ID		4732-28		4744-01		4744-01 Lab Dup		4744-02		4744-03		4744-04	
Date Collected		3/9/09		3/9/09		3/9/09		3/9/09		3/10/09		3/10/09	
Date Analyzed		3/12/09		3/23/09		3/23/09		3/23/09		3/23/09		3/23/09	
MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
0.003	0.010	ND	1	BQL(0.006)	1	BQL(0.006)(RPD=NA)	1	BQL(0.004)	1	ND	1	ND	1
0.034	0.111	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	BQL(0.058)	1
0.006	0.020	ND	1	ND	1	ND(RPD=NA)	1	0.048	1	ND	1	ND	1
0.003	0.010	0.145	1	ND	1	ND(RPD=NA)	1	ND	1	0.109	1	ND	1
0.002	0.007	0.141	1	0.678	1	0.682(RPD=0.59)	1	1.16	1	0.243	1	0.189	1
0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
0.255	0.851	50.2	1	173	1	174(RPD=0.58)	1	151	1	112	1	98.6	1
0.001	0.004	ND	1	0.033	1	0.033(RPD=0.00)	1	0.013	1	BQL(0.002)	1	0.005	1
0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
0.004	0.013	ND	1	0.018	1	0.019(RPD=5.41)	1	BQL(0.010)	1	ND	1	BQL(0.007)	1
0.026	0.087	5.02	1	661	1	667(RPD=0.90)	1	312	1	40.6	1	121	1
0.047	0.156	1.43	1	5.09	1	5.07(RPD=0.39)	1	1.41	1	1.43	1	1.91	1
0.034	0.111	5.49	1	91.7	1	92.0(RPD=0.33)	1	84.9	1	17.4	1	22.1	1
0.001	0.004	0.252	1	0.838	1	0.838(RPD=0.00)	1	0.841	1	0.579	1	0.534	1
0.001	0.004	0.009	1	BQL(0.001)	1	BQL(0.002)(RPD=NA)	1	BQL(0.004)	1	0.006	1	0.008	1
0.061	0.201	133	1	173	1	174(RPD=0.58)	1	226	1	69.6	1	66.8	1
0.003	0.010	ND	1	BQL(0.005)	1	BQL(0.004)(RPD=NA)	1	ND	1	ND	1	ND	1
0.001	0.004	ND	1	0.118	1	0.117(RPD=0.85)	1	0.050	1	0.006	1	0.020	1
0.004	0.013	BQL(0.010)	1	0.030	1	0.036(RPD=18.18)	1	0.021	1	0.015	1	0.017	1
0.005	0.015	0.052	1	0.048	1	0.052(RPD=8.00)	1	0.037	1	0.026	1	0.024	1
0.001	0.004	0.506	1	2.34	1	2.36(RPD=0.85)	1	2.52	1	1.14	1	0.651	1
0.002	0.007	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
0.005	0.015	ND	1	0.038	1	0.040(RPD=5.13)	1	ND	1	ND	1	ND	1
0.003	0.010	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
0.040	0.134	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
0.186	0.618	19.7	1	17.0	1	17.0(RPD=0.00)	1	10.7	1	20.8	1	18.0	1
0.069	0.228	4.42	1	5.17	1	5.24(RPD=1.34)	1	4.98	1	2.99	1	3.70	1
0.017	0.056	1.68	1	0.496	1	0.502(RPD=1.20)	1	0.247	1	0.121	1	0.773	1
0.004	0.013	ND	1	0.027	1	0.027(RPD=0.00)	1	0.018	1	ND	1	ND	1

Comments:

No problems noted.

Notes:

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	BQL(0.005)	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.034	0.111	ND	1	ND	1	ND	1	ND	1	ND	1	BQL(0.053)	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND	1	ND	1	ND	1	0.125	1	ND	1	ND	1
Boron (B)	7440-42-8	mg/L	0.003	0.010	0.075	1	0.129	1	ND	1	ND	1	0.160	1	0.079	1
Barium (Ba)	7440-39-3	mg/L	0.002	0.007	1.04	1	0.773	1	0.383	1	0.295	1	0.165	1	0.122	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.255	0.851	194	1	139	1	153	1	110	1	39.7	1	65.6	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.002)	1	BQL(0.001)	1	0.013	1	BQL(0.004)	1	ND	1	BQL(0.002)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.004	0.013	ND	1	ND	1	BQL(0.012)	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.026	0.087	59.5	1	24.0	1	337	1	110	1	5.31	1	55.0	1
Potassium (K)	7440-09-7	mg/L	0.047	0.156	1.81	1	1.73	1	5.56	1	1.34	1	1.27	1	1.69	1
Magnesium (Mg)	7439-95-4	mg/L	0.034	0.111	25.2	1	17.1	1	58.6	1	44.1	1	5.55	1	13.9	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	1.11	1	0.824	1	0.467	1	0.444	1	0.190	1	0.334	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.005	1	0.007	1	0.006	1	0.007	1	0.005	1	0.007	1
Sodium (Na)	7440-23-5	mg/L	0.061	0.201	92.6	1	127	1	108	1	105	1	47.6	1	58.5	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.001	0.004	0.011	1	0.004	1	0.057	1	0.019	1	ND	1	0.011	1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.013	0.018	1	0.018	1	0.021	1	0.019	1	BQL(0.010)	1	0.014	1
Selenium (Se)	7782-49-2	mg/L	0.005	0.015	0.029	1	0.042	1	0.049	1	0.045	1	0.027	1	0.022	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	2.51	1	1.66	1	1.47	1	1.36	1	0.472	1	0.386	1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.015	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Vanadium (V)	7440-62-2	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.040	0.134	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.186	0.618	19.7	1	21.2	1	11.2	1	15.1	1	18.6	1	20.7	1
Sulfur (S)	7704-34-9	mg/L	0.069	0.228	4.46	1	2.81	1	7.65	1	4.30	1	4.49	1	8.88	1
Phosphorus (P)	7723-14-0	mg/L	0.017	0.056	0.322	1	0.238	1	0.261	1	0.253	1	1.41	1	0.946	1
Uranium (U)	7440-61-1	mg/L	0.004	0.013	BQL(0.009)	1	ND	1	0.014	1	BQL(0.006)	1	ND	1	ND	1

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

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Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	BQL(0.004)	1	ND	1	ND	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.034	0.111	BQL(0.049)	1	ND	1	ND	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND	1	ND	1	ND	1	0.038	1	ND	1	ND	1
Boron (B)	7440-42-8	mg/L	0.003	0.010	0.103	1	0.129	1	ND	1	BQL(0.006)	1	0.152	1	0.120	1
Barium (Ba)	7440-39-3	mg/L	0.002	0.007	0.118	1	0.439	1	0.474	1	0.180	1	0.118	1	0.092	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.255	0.851	68.6	1	101	1	92.5	1	61.4	1	29.7	1	44.4	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.001)	1	ND	1	0.008	1	BQL(0.002)	1	ND	1	ND	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.004	0.013	ND	1	ND	1	BQL(0.009)	1	ND	1	ND	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.026	0.087	41.2	1	16.5	1	241	1	80.9	1	10.4	1	11.0	1
Potassium (K)	7440-09-7	mg/L	0.047	0.156	1.73	1	1.92	1	7.55	1	0.839	1	1.02	1	1.47	1
Magnesium (Mg)	7439-95-4	mg/L	0.034	0.111	14.3	1	11.4	1	49.0	1	33.3	1	8.00	1	8.84	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.407	1	0.567	1	0.455	1	0.236	1	0.124	1	0.192	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.007	1	0.008	1	0.007	1	0.007	1	0.005	1	0.006	1
Sodium (Na)	7440-23-5	mg/L	0.061	0.201	78.1	1	119	1	128	1	52.1	1	54.2	1	61.5	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.001	0.004	0.008	1	0.004	1	0.042	1	0.015	1	0.005	1	BQL(0.003)	1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.013	0.016	1	0.017	1	0.026	1	0.014	1	BQL(0.009)	1	BQL(0.010)	1
Selenium (Se)	7782-49-2	mg/L	0.005	0.015	0.019	1	0.034	1	0.046	1	0.053	1	0.026	1	0.017	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.401	1	1.10	1	1.08	1	0.594	1	0.254	1	0.308	1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.015	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Vanadium (V)	7440-62-2	mg/L	0.003	0.010	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.040	0.134	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.186	0.618	23.5	1	22.4	1	5.95	1	8.31	1	16.5	1	16.1	1
Sulfur (S)	7704-34-9	mg/L	0.069	0.228	5.98	1	2.98	1	3.88	1	2.77	1	9.76	1	4.05	1
Phosphorus (P)	7723-14-0	mg/L	0.017	0.056	0.330	1	0.367	1	0.229	1	0.323	1	1.35	1	1.37	1
Uranium (U)	7440-61-1	mg/L	0.004	0.013	ND	1	ND	1	BQL(0.011)	1	BQL(0.006)	1	ND	1	ND	1

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

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Shaw Environmental and Infrastructure, Inc.

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Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analytes		Unit	Field Sample ID		ML4-6		ML4-7		ML4-7		ML3-2		ML3-3		ML3-4	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1	ND	1	ND(RPD=NA)	1	ND	1	BQL(0.005)	1	ND	1
Aluminum (Al)	7429-90-5	mg/L	0.034	0.111	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Boron (B)	7440-42-8	mg/L	0.003	0.010	0.128	1	0.129	1	0.131(RPD=1.54)	1	0.147	1	ND	1	ND	1
Barium (Ba)	7440-39-3	mg/L	0.002	0.007	0.081	1	0.254	1	0.254(RPD=0.00)	1	0.958	1	0.585	1	0.112	1
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Calcium (Ca)	7440-70-2	mg/L	0.255	0.851	40.8	1	71.3	1	71.4(RPD=0.14)	1	109	1	169	1	52.9	1
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	BQL(0.004)	1	0.015	1	BQL(0.003)	1
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Copper (Cu)	7440-50-8	mg/L	0.004	0.013	ND	1	ND	1	ND(RPD=NA)	1	ND	1	BQL(0.012)	1	ND	1
Iron (Fe)	7439-89-6	mg/L	0.026	0.087	9.28	1	8.93	1	8.95(RPD=0.22)	1	99.3	1	378	1	92.0	1
Potassium (K)	7440-09-7	mg/L	0.047	0.156	1.30	1	1.36	1	1.42(RPD=4.32)	1	278	1	6.94	1	17.8	1
Magnesium (Mg)	7439-95-4	mg/L	0.034	0.111	8.47	1	8.00	1	8.02(RPD=0.25)	1	29.6	1	67.9	1	8.55	1
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.194	1	0.393	1	0.393(RPD=0.00)	1	0.274	1	0.410	1	0.133	1
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.006	1	0.006	1	0.007(RPD=15.38)	1	0.005	1	0.006	1	0.007	1
Sodium (Na)	7440-23-5	mg/L	0.061	0.201	67.6	1	84.3	1	84.3(RPD=0.00)	1	597	1	137	1	63.9	1
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1	ND	1	ND(RPD=NA)	1	ND	1	BQL(0.003)	1	ND	1
Lead (Pb)	7439-92-1	mg/L	0.001	0.004	0.004	1	BQL(0.003)	1	BQL(0.003)(RPD=NA)	1	0.019	1	0.066	1	0.017	1
Antimony (Sb)	7440-36-0	mg/L	0.004	0.013	0.014	1	BQL(0.012)	1	0.014(RPD=NA)	1	0.019	1	0.033	1	0.013	1
Selenium (Se)	7782-49-2	mg/L	0.005	0.015	0.031	1	0.027	1	0.026(RPD=3.77)	1	0.039	1	0.052	1	0.036	1
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.287	1	0.558	1	0.559(RPD=0.18)	1	2.83	1	2.14	1	0.748	1
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Thallium (Tl)	7440-28-0	mg/L	0.005	0.015	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Vanadium (V)	7440-62-2	mg/L	0.003	0.010	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Zinc (Zn)	7440-66-6	mg/L	0.040	0.134	ND	1	ND	1	ND(RPD=NA)	1	ND	1	ND	1	ND	1
Silicon (Si)	7440-21-3	mg/L	0.186	0.618	16.9	1	17.6	1	17.7(RPD=0.57)	1	7.71	1	8.53	1	9.74	1
Sulfur (S)	7704-34-9	mg/L	0.069	0.228	3.25	1	1.94	1	1.94(RPD=0.00)	1	1.35	1	1.85	1	0.986	1
Phosphorus (P)	7723-14-0	mg/L	0.017	0.056	1.36	1	1.11	1	1.11(RPD=0.00)	1	0.067	1	0.303	1	0.539	1
Uranium (U)	7440-61-1	mg/L	0.004	0.013	ND	1	ND	1	ND(RPD=NA)	1	BQL(0.010)	1	0.020	1	BQL(0.010)	1

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Shaw Environmental and Infrastructure, Inc.

Analytical Service Results Report

Laboratory:

Metals

Report Date:

3/24/09

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Technical Directive:

5ME566SF

Sample Results (1, 2)

Analysts:

Sandra Saye

Method:

RSKSOP 213(3)

Analytes		Unit	MDL	QL	Field Sample ID		ML3-5		ML3-6		ML3-7					
Names	Codes				Sample Lab ID		4744-22		4744-23		4744-24					
					Date Collected		3/14/09		3/14/09		3/14/09					
					Date Analyzed		3/23/09		3/23/09		3/23/09					
					Data	DF			Data	DF			Data	DF	Data	DF
Silver (Ag)	7440-22-4	mg/L	0.003	0.010	ND	1			ND	1						
Aluminum (Al)	7429-90-5	mg/L	0.034	0.111	ND	1			ND	1						
Arsenic (As)	7440-38-2	mg/L	0.006	0.020	ND	1			ND	1						
Boron (B)	7440-42-8	mg/L	0.003	0.010	ND	1			ND	1	0.107	1				
Barium (Ba)	7440-39-3	mg/L	0.002	0.007	0.336	1			0.053	1	0.046	1				
Beryllium (Be)	7440-41-7	mg/L	0.001	0.004	ND	1			ND	1	ND	1				
Calcium (Ca)	7440-70-2	mg/L	0.255	0.851	94.8	1			28.1	1	35.3	1				
Cadmium (Cd)	7440-43-9	mg/L	0.001	0.004	BQL(0.002)	1			BQL(0.003)	1	ND	1				
Cobalt (Co)	7440-48-4	mg/L	0.001	0.004	ND	1			ND	1	ND	1				
Chromium (Cr)	7440-47-3	mg/L	0.001	0.004	ND	1			ND	1	ND	1				
Copper (Cu)	7440-50-8	mg/L	0.004	0.013	ND	1			ND	1	ND	1				
Iron (Fe)	7439-89-6	mg/L	0.026	0.087	85.8	1			109	1	17.3	1				
Potassium (K)	7440-09-7	mg/L	0.047	0.156	25.0	1			1.48	1	1.52	1				
Magnesium (Mg)	7439-95-4	mg/L	0.034	0.111	17.5	1			17.3	1	6.10	1				
Manganese (Mn)	7439-96-5	mg/L	0.001	0.004	0.490	1			0.269	1	0.248	1				
Molybdenum (Mo)	7439-98-7	mg/L	0.001	0.004	0.009	1			0.006	1	0.005	1				
Sodium (Na)	7440-23-5	mg/L	0.061	0.201	103	1			122	1	107	1				
Nickel (Ni)	7440-02-0	mg/L	0.003	0.010	ND	1			ND	1	ND	1				
Lead (Pb)	7439-92-1	mg/L	0.001	0.004	0.015	1			0.021	1	0.006	1				
Antimony (Sb)	7440-36-0	mg/L	0.004	0.013	0.022	1			0.018	1	BQL(0.011)	1				
Selenium (Se)	7782-49-2	mg/L	0.005	0.015	0.067	1			0.056	1	0.021	1				
Strontium (Sr)	7440-24-6	mg/L	0.001	0.004	0.880	1			0.434	1	0.221	1				
Titanium (Ti)	7440-32-6	mg/L	0.002	0.007	ND	1			ND	1	ND	1				
Thallium (Tl)	7440-28-0	mg/L	0.005	0.015	ND	1			ND	1	ND	1				
Vanadium (V)	7440-62-2	mg/L	0.003	0.010	ND	1			ND	1	ND	1				
Zinc (Zn)	7440-66-6	mg/L	0.040	0.134	ND	1			ND	1	ND	1				
Silicon (Si)	7440-21-3	mg/L	0.186	0.618	8.55	1			15.3	1	23.6	1				
Sulfur (S)	7704-34-9	mg/L	0.069	0.228	0.696	1			0.405	1	0.895	1				
Phosphorus (P)	7723-14-0	mg/L	0.017	0.056	0.639	1			0.349	1	1.45	1				
Uranium (U)	7440-61-1	mg/L	0.004	0.013	0.014	1			ND	1	ND	1				

Comments:

No problems noted.

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.
2. " -" denotes that the information is not available or the analyte is not analyzed.

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Analytical Service Results Report

Laboratory: **Metals** Report Date: **3/31/09**

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Technical Directive: **5ME566SF**

Sample Results (1, 2)

Analysts: **Steve Markham**

Method: **RSKSOP 257(2)**

Field Sample ID	PMW-3	PMW-3	PMW-2	Field Blank	PMW-1	Dup-1
Sample Lab ID	4732-01	4732-01 Lab Dup.	4732-02	4732-03	4732-04	4732-05
Date Collected	3/4/09	3/4/09	3/4/09	3/4/09	3/4/09	3/4/09
Date Analyzed	3/18 & 3/25/09	3/18 & 3/25/09	3/18 & 3/25/09	3/18, 3/25 & 3/26/09	3/18 & 3/25/09	3/18 & 3/25/09

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	8.49	1	8.41 (RPD=0.95)	1	24.5	1	ND	1	12.8	1	13.9	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	4.53	1	4.62 (RPD=1.97)	1	9.93	1	ND	1	16.3	1	18.9	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	1.14	1	1.22 (RPD=6.78)	1	1.05	1	0.292	1	1.20	1	1.89	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	1.89	1	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	0.181	1	0.171 (RPD=5.68)	1	BQL(0.026)	1	ND	1	BQL(0.059)	1	BQL(0.069)	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	—	—	—	—	—	—	ND	1	—	—	—	—
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.014	1	0.013 (RPD=7.41)	1	8.94	1	ND	1	0.139	1	0.137	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	1.06	1	1.08 (RPD=1.87)	1	1.10	1	ND	1	1.60	1	1.95	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1

Comments:
Per the Technical Directive selected analytes were to be analyzed by ICP-MS if less than the quantitation limit for the ICP analysis. All QC results met criteria established in RSKSOP 257(2).

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit. BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: 5ME566SF

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Field Sample ID	PMW-6	PMW-5	Dup-2	PMW-4	ML 2-2	ML 2-3
Sample Lab ID	4732-06	4732-07	4732-08	4732-09	4732-10	4732-11
Date Collected	3/4/09	3/5/09	3/5/09	3/5/09	3/5/09	3/5/09
Date Analyzed	3/18 & 3/25/09	3/18 & 3/25/09	3/18 & 3/25/09	3/18 & 3/25/09	3/18 & 3/25/09	3/18 & 3/25/09

Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names	Codes															
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	9.03	1	8.44	1	8.02	1	17.9	1	23.2	1	4.10	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	7.91	1	10.7	1	8.11	1	6.43	1	13.2	1	8.14	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.761	1	1.58	1	1.16	1	1.80	1	4.21	1	2.10	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	0.107	1	0.761	1	BQL(0.031)	1	0.392	1	0.172	1	0.367	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	—	—	—	—	—	—	—	—	—	—	—	—
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.929	1	0.013	1	0.012	1	0.061	1	BQL(0.004)	1	BQL(0.007)	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	0.272	1	1.24	1	1.02	1	8.15	1	2.66	1	0.632	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	ND	1	ND	1	ND	1	BQL(0.027)	1

Comments:
Per the Technical Directive selected analytes were to be analyzed by ICP-MS if less than the quantitation limit for the ICP analysis. All QC results met criteria established in RSKSOP 257(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental and Infrastructure, Inc.

Analytical Service Results Report

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Technical Directive:

5ME566SF

Sample Results (1, 2)

Analysts:

Steve Markham

Method:

RSKSOP 257(2)

Analytes		Unit	MDL	QL	ML 2-3		ML 2-4		ML 2-5		ML 2-6		ML 2-7		ML 5-2	
Names	Codes				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	4.03 (RPD=1.72)	1	3.43	1	1.77	1	2.71	1	3.83	1	13.5	1
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	8.48 (RPD=4.09)	1	10.5	1	7.09	1	8.69	1	9.85	1	12.0	1
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	2.12 (RPD=0.95)	1	1.48	1	1.05	1	0.996	1	2.25	1	1.32	1
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	0.368 (RPD=0.27)	1	ND	1	BQL(0.059)	1	BQL(0.050)	1	0.987	1	0.127	1
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	—	—	—	—	—	—	—	—	—	—	—	—
Uranium (U)	7440-61-1	µg/L	0.002	0.007	BQL(0.007) (RPD=NA)	1	BQL(0.003)	1	0.034	1	0.177	1	0.447	1	BQL(0.006)	1
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	0.637 (RPD=0.79)	1	0.767	1	0.370	1	0.409	1	0.674	1	0.979	1
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	BQL(0.023) (RPD=NA)	1	ND	1	BQL(0.023)	1	BQL(0.021)	1	BQL(0.020)	1	BQL(0.026)	1

Comments:

Per the Technical Directive selected analytes were to be analyzed by ICP-MS if less than the quantitation limit for the ICP analysis. All QC results met criteria established in RSKSOP 257(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat. Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: 5ME566SF

Sample Results (1, 2)

Analysts:	Steve Markham		Field Sample ID		ML 5-3		Dup-3		ML 5-4		ML 5-5		ML 5-6		ML 5-6		
			Sample Lab ID		4732-17		4732-18		4732-19		4732-20		4732-21		4732-21 Lab Dup.		
			Date Collected		3/6/09		3/6/09		3/7/09		3/7/09		3/7/09		3/7/09		
			Date Analyzed		3/18 & 3/25/09		3/18 & 3/25/09		3/18 & 3/25/09		3/18 & 3/25/09		3/18 & 3/25/09		3/18 & 3/25/09		
Method:	RSKSOP 257(2)		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Analytes																	
Names		Codes															
Arsenic (As)		7440-38-2	µg/L	0.014	0.047	—	—	—	—	2.16	1	1.94	1	2.09	1	2.15 (RPD=2.83)	1
Chromium (Cr)		7440-47-3	µg/L	0.030	0.100	12.5	1	8.43	1	5.90	1	8.84	1	11.8	1	12.1 (RPD=2.51)	1
Copper (Cu)		7440-50-8	µg/L	0.072	0.240	1.38	1	1.70	1	1.56	1	0.608	1	0.735	1	0.740 (RPD=0.68)	1
Iron (Fe)		7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)		7439-92-1	µg/L	0.025	0.084	0.085	1	BQL(0.080)	1	BQL(0.053)	1	BQL(0.048)	1	ND	1	ND (RPD=NA)	1
Selenium (Se)		7782-49-2	µg/L	0.169	0.564	—	—	—	—	—	—	—	—	—	—	—	—
Uranium (U)		7440-61-1	µg/L	0.002	0.007	BQL(0.004)	1	BQL(0.005)	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1
Zinc (Zn)		7440-66-6	µg/L	0.079	0.264	1.35	1	0.772	1	0.673	1	BQL(0.199)	1	0.583	1	0.626 (RPD=7.11)	1
Mercury (Hg)		7439-97-6	µg/L	0.017	0.057	BQL(0.019)	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1

Comments:
Per the Technical Directive selected analytes were to be analyzed by ICP-MS if less than the quantitation limit for the ICP analysis. All QC results met criteria established in RSKSOP 257(2).

Notes:
1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
Note that the applicable MDL is given only for the case DF=1.

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Technical Directive: 5ME566SF

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Analysts:	Steve Markham		Unit		Field Sample ID		ML 5-7		ML 1-2		ML 1-3		ML 1-4		ML 1-5		ML 1-6								
	RSKSOP 257(2)				Sample Lab ID		4732-22		4732-23		4732-24		4732-25		4732-26		4732-27								
Date Collected					3/7/09		3/7/09		3/7/09		3/9/09		3/9/09		3/9/09										
Date Analyzed					3/18 & 3/25/09		3/18 & 3/25/09		3/18 & 3/25/09		3/18 & 3/25/09		3/18 & 3/25/09		3/18 & 3/25/09										
Analytes				Unit		MDL		QL		Data		DF		Data		DF		Data		DF		Data		DF	
Names		Codes																							
Arsenic (As)		7440-38-2	µg/L	0.014	0.047	2.43	1	4.95	1	35.4	1	12.0	1	9.75	1	2.19	1								
Chromium (Cr)		7440-47-3	µg/L	0.030	0.100	14.6	1	18.4	1	17.0	1	13.4	1	13.0	1	8.32	1								
Copper (Cu)		7440-50-8	µg/L	0.072	0.240	1.11	1	1.29	1	0.877	1	0.537	1	0.679	1	2.01	1								
Iron (Fe)		7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—								
Lead (Pb)		7439-92-1	µg/L	0.025	0.084	BQL(0.067)	1	BQL(0.030)	1	BQL(0.066)	1	ND	1	BQL(0.032)	1	0.289	1								
Selenium (Se)		7782-49-2	µg/L	0.169	0.564	—	—	—	—	—	—	—	—	—	—	—	—								
Uranium (U)		7440-61-1	µg/L	0.002	0.007	0.151	1	0.035	1	0.042	1	0.008	1	0.016	1	0.042	1								
Zinc (Zn)		7440-66-6	µg/L	0.079	0.264	0.760	1	1.33	1	0.581	1	1.40	1	1.54	1	3.27	1								
Mercury (Hg)		7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	BQL(0.018)	1	BQL(0.017)	1	ND	1	BQL(0.031)	1								

Comments:
Per the Technical Directive selected analytes were to be analyzed by ICP-MS if less than the quantitation limit for the ICP analysis. All QC results met criteria established in RSKSOP 257(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicable. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental and Infrastructure, Inc.

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Technical Directive:

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Sample Results (1, 2)

Analysts:

Steve Markham

Method:

RSKSOP 257(2)

Analytes		Unit	MDL		QL		Data		DF		Data		DF		Data		DF		Data		DF		Data		DF		Data		DF	
Names	Codes		MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	1.86	1	8.12	1	7.77 (RPD=4.41)	1	86.0	1	1.71	1	2.27	1														
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	15.4	1	0.401	1	0.390 (RPD=2.78)	1	0.427	1	0.639	1	0.605	1														
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.741	1	1.87	1	1.84 (RPD=1.62)	1	0.885	1	0.568	1	2.22	1														
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—														
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	BQL(0.029)	1	0.101	1	0.107 (RPD=5.77)	1	ND	1	ND	1	0.795	1														
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	—	—	—	—	—	—	—	—	—	—	—	—														
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.009	1	BQL(0.002)	1	BQL(0.002) (RPD=NA)	1	BQL(0.004)	1	BQL(0.004)	1	BQL(0.003)	1														
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	2.39	1	1.54	1	1.25 (RPD=20.79)	1	0.961	1	0.407	1	0.451	1														
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	BQL(0.032)	1	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.042)	1	ND	1														

Comments:

Per the Technical Directive selected analytes were to be analyzed by ICP-MS if less than the quantitation limit for the ICP analysis. All QC results met criteria established in RSKSOP 257(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applical Note that the applicable MDL is given only for the case DF=1.

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Analytical Service Results Report

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Technical Directive: 5ME566SF

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Analysts:	Steve Markham		Field Sample ID		ML 7-6		ML 7-7		ML 6-2		ML 6-3		ML 6-4		ML 6-5			
	Sample Lab ID				4744-05		4744-06		4744-07		4744-08		4744-09		4744-10			
Method:	RSKSOP 257(2)		Date Collected		3/10/09		3/10/09		3/10/09		3/10/09		3/11/09		3/11/09			
	Date Analyzed				3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09			
Analytes				Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF		
Names		Codes																
Arsenic (As)		7440-38-2		µg/L	0.014	0.047	1.80	1	2.04	1	10.7	1	—	—	1.24	1	2.01	1
Chromium (Cr)		7440-47-3		µg/L	0.030	0.100	0.290	1	0.180	1	0.369	1	0.426	1	0.451	1	0.543	1
Copper (Cu)		7440-50-8		µg/L	0.072	0.240	0.628	1	ND	1	ND	1	ND	1	ND	1	ND	1
Iron (Fe)		7439-89-6		µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
Lead (Pb)		7439-92-1		µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1
Selenium (Se)		7782-49-2		µg/L	0.169	0.564	—	—	—	—	—	—	—	—	—	—	—	—
Uranium (U)		7440-61-1		µg/L	0.002	0.007	ND	1	BQL(0.003)	1	ND	1	ND	1	ND	1	ND	1
Zinc (Zn)		7440-66-6		µg/L	0.079	0.264	0.391	1	0.799	1	ND	1	ND	1	ND	1	ND	1
Mercury (Hg)		7439-97-6		µg/L	0.017	0.057	ND	1	ND	1	ND	1	ND	1	ND	1	ND	1

Comments:
Per the Technical Directive selected analytes were to be analyzed by ICP-MS if less than the quantitation limit for the ICP analysis. All QC results met criteria established in RSKSOP 257(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit; BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat. Note that the applicable MDL is given only for the case DF=1.

Shaw Environmental and Infrastructure, Inc.
Analytical Service Results Report

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Technical Directive: 5ME566SF

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Analysts:	Steve Markham		Field Sample ID		ML 6-6		ML 6-6		ML 6-7		ML 4-2		ML 4-3		ML 4-4		
	RSKSOP 257(2)				Sample Lab ID		4744-11		4744-11 Lab Dup.		4744-12		4744-13		4744-14		4744-15
Date Collected					3/11/09		3/11/09		3/11/09		3/11/09		3/11/09		3/12/09		
Date Analyzed					3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		
Method:	Analytes		Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
	Names	Codes															
	Arsenic (As)	7440-38-2	µg/L	0.014	0.047	3.36	1	3.36 (RPD=0.00)	1	1.96	1	9.93	1	—	—	4.01	1
	Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.485	1	0.488 (RPD=0.62)	1	0.247	1	0.441	1	0.452	1	0.378	1
	Copper (Cu)	7440-50-8	µg/L	0.072	0.240	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
	Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—
	Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND (RPD=NA)	1	ND	1	ND	1	ND	1	ND	1
	Selenium (Se)	7782-49-2	µg/L	0.169	0.564	—	—	—	—	—	—	—	—	—	—	—	—
	Uranium (U)	7440-61-1	µg/L	0.002	0.007	ND	1	ND (RPD=NA)	1	BQL(0.002)	1	0.019	1	0.012	1	BQL(0.007)	1
	Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	1.30	1	1.25 (RPD=3.92)	1	ND	1	ND	1	ND	1	0.581	1
	Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND (RPD=NA)	1	ND	1	BQL(0.019)	1	ND	1	ND	1

Comments:
Per the Technical Directive selected analytes were to be analyzed by ICP-MS if less than the quantitation limit for the ICP analysis. All QC results met criteria established in RSKSOP 257(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit. BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
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Technical Directive: 5ME566SF

Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Analysts:	Steve Markham				Field Sample ID		ML 4-5		ML 4-6		ML 4-7		ML 3-2		ML 3-3		ML 3-3	
	RSKSOP 257(2)				Sample Lab ID		4744-16		4744-17		4744-18		4744-19		4744-20		4744-20 Lab Dup.	
Method:					Date Collected		3/12/09		3/12/09		3/12/09		3/13/09		3/13/09		3/13/09	
					Date Analyzed		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09	
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	
Names	Codes																	
Arsenic (As)	7440-38-2	µg/L	0.014	0.047	1.09	1	1.00	1	0.933	1	16.7	1	20.2	1	20.1 (RPD=0.50)	1		
Chromium (Cr)	7440-47-3	µg/L	0.030	0.100	0.298	1	0.300	1	0.233	1	0.123	1	ND	1	ND (RPD=NA)	1		
Copper (Cu)	7440-50-8	µg/L	0.072	0.240	0.363	1	ND	1	ND	1	ND	1	BQL(0.089)	1	BQL(0.075) (RPD=NA)	1		
Iron (Fe)	7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—	—	—	—	—		
Lead (Pb)	7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1	BQL(0.069)	1	BQL(0.066) (RPD=NA)	1		
Selenium (Se)	7782-49-2	µg/L	0.169	0.564	—	—	—	—	—	—	—	—	—	—	—	—		
Uranium (U)	7440-61-1	µg/L	0.002	0.007	0.008	1	ND	1	0.016	1	0.031	1	BQL(0.004)	1	BQL(0.005) (RPD=NA)	1		
Zinc (Zn)	7440-66-6	µg/L	0.079	0.264	1.44	1	0.724	1	0.737	1	1.16	1	5.82	1	5.74 (RPD=1.38)	1		
Mercury (Hg)	7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	ND	1	ND	1	ND	1	ND (RPD=NA)	1		

Comments:
Per the Technical Directive selected analytes were to be analyzed by ICP-MS if less than the quantitation limit for the ICP analysis. All QC results met criteria established in RSKSOP 257(2).

Notes:

1. If the parameter was detected above the quantitation limit (QL), the numeric result is reported; BQL denotes that the parameter was not detected at or above the quantitation limit. BQL () denotes that the parameter was detected above the method detection limit (MDL) but below QL and the estimated numeric result is reported in parenthesis; ND denotes that the parameter was not detected at all. All the results are corrected with dilution factors (DF), if applicat
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Sample Results (1, 2)

Analysts: Steve Markham

Method: RSKSOP 257(2)

Analysts:	Steve Markham		Field Sample ID		ML 3-4		ML 3-5		ML 3-6		ML 3-7						
			Sample Lab ID		4744-21		4744-22		4744-23		4744-24						
Method:	RSKSOP 257(2)		Date Collected		3/14/09		3/14/09		3/14/09		3/14/09						
			Date Analyzed		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09		3/25, 3/26 & 3/30/09						
Analytes			Unit	MDL	QL	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
Names		Codes															
Arsenic (As)		7440-38-2	µg/L	0.014	0.047	1.39	1	1.31	1	1.38	1	1.31	1				
Chromium (Cr)		7440-47-3	µg/L	0.030	0.100	BQL(0.094)	1	ND	1	0.106	1	BQL(0.091)	1				
Copper (Cu)		7440-50-8	µg/L	0.072	0.240	ND	1	ND	1	ND	1	ND	1				
Iron (Fe)		7439-89-6	µg/L	0.289	0.964	—	—	—	—	—	—	—	—				
Lead (Pb)		7439-92-1	µg/L	0.025	0.084	ND	1	ND	1	ND	1	ND	1				
Selenium (Se)		7782-49-2	µg/L	0.169	0.564	—	—	—	—	—	—	—	—				
Uranium (U)		7440-61-1	µg/L	0.002	0.007	ND	1	BQL(0.006)	1	ND	1	0.010	1				
Zinc (Zn)		7440-66-6	µg/L	0.079	0.264	1.94	1	ND	1	0.643	1	ND	1				
Mercury (Hg)		7439-97-6	µg/L	0.017	0.057	ND	1	ND	1	ND	1	ND	1				

Comments:
Per the Technical Directive selected analytes were to be analyzed by ICP-MS if less than the quantitation limit for the ICP analysis. All QC results met criteria established in RSKSOP 257(2).

Notes:

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General Parameters

Report Date:

03/25/09

Technical Directive:

EPAGP077

Analyst:

Kristie Hargrove

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Analytes		Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)			
				Codes		7440-44-0-TIC		7440-44-0-TOC			
				Methods		RSKSOP-265 Rev. 3		RSKSOP-265 Rev. 3			
				Unit		mg/L		mg/L			
				MDL		0.025**		0.049**			
				QL		0.500**		0.500**			
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF				
PMW-3	4732-1	3/4/2009	3/18-3/24/2009	46.1 (± 0.0249)	8	46.9 (± 0.0341)	10				
PMW-2	4732-2	3/4/2009	3/18-3/24/2009	72.3 (± 0.0656)	8	21.3 (± 0.0289)	4				
FIELD BLANK	4732-3	3/4/2009	3/18-3/24/2009	BQL (0.217) (± 0.0215)	1	ND (0.038)(± 0.0462)	1				
PMW-1	4732-4	3/4/2009	3/18-3/24/2009	99.3 (± 0.0599)	8	28.9 (± 0.0494)	8				
DUPLICATE 1	4732-5	3/4/2009	3/18-3/24/2009	95.6 (± 0.0770)	8	27.7 (± 0.0505)	8				
PMW-6	4732-6	3/4/2009	3/18-3/24/2009	55.9 (± 0.0396)	8	10.6 (± 0.0028)	4				
PMW-5	4732-7	3/5/2009	3/18-3/24/2009	48.0 (± 0.0020)	8	183 (± 0.0280)	20				
DUPLICATE 2	4732-8	3/5/2009	3/18-3/24/2009	39.7 (± 0.0666)	8	182 (± 0.0405)	20				
PMW-4	4732-9	3/5/2009	3/18-3/24/2009	48.1 (± 0.0214)	8	25.5 (± 0.0692)	4				
ML2-2	4732-10	3/5/2009	3/18-3/24/2009	7.58 (± 0.0384)	2	961 (± 0.0453)	50				
ML2-2	4732-10 Lab Dup	3/5/2009	3/18-3/24/2009	7.33 (± 0.0215) (RPD=3.35)	2	958 (± 0.0771) (RPD=0.313)	50				
ML2-3	4732-11	3/5/2009	3/18-3/24/2009	65.5 (± 0.0167)	8	121 (± 0.0107)	10				
ML2-4	4732-12	3/6/2009	3/18-3/24/2009	46.0 (± 0.0337)	8	128 (± 0.1793)	10				
ML2-5	4732-13	3/6/2009	3/18-3/24/2009	47.1 (± 0.0457)	8	7.10 (± 0.1190)	4				
ML2-6	4732-14	3/6/2009	3/18-3/24/2009	62.5 (± 0.0436)	8	9.23 (± 0.0144)	4				
ML2-7	4732-15	3/6/2009	3/18-3/24/2009	72.3 (± 0.0549)	8	12.7 (± 0.0298)	4				
ML5-2	4732-16	3/6/2009	3/18-3/24/2009	57.3 (± 0.0183)	8	195 (± 0.2149)	10				
ML5-3	4732-17	3/6/2009	3/18-3/24/2009	62.9 (± 0.0168)	8	139 (± 0.0801)	10				
DUPLICATE 3	4732-18	3/6/2009	3/18-3/24/2009	52.2 (± 0.0746)	8	135 (± 0.0552)	10				
ML5-4	4732-19	3/7/2009	3/18-3/24/2009	42.9 (± 0.0377)	8	43.2 (± 0.0294)	8				
ML5-5	4732-20	3/7/2009	3/18-3/24/2009	46.9 (± 0.0351)	8	38.6 (± 0.0228)	10				
ML5-5	4732-20 Lab Dup	3/7/2009	3/18-3/24/2009	44.0 (± 0.0309) (RPD=6.38)	8	38.8 (± 0.0153) (RPD=0.517)	10				
ML5-6	4732-21	3/7/2009	3/18-3/24/2009	48.4 (± 0.0294)	8	30.4 (± 0.0197)	10				
ML5-7	4732-22	3/7/2009	3/18-3/24/2009	79.9 (± 0.0871)	8	12.8 (± 0.0024)	4				
ML1-2	4732-23	3/7/2009	3/18-3/24/2009	67.5 (± 0.0585)	8	36.6 (± 0.2347)	4				
ML1-3	4732-24	3/7/2009	3/18-3/24/2009	83.9 (± 0.0343)	8	36.8 (± 0.1042)	4				
ML1-4	4732-25	3/9/2009	3/18-3/24/2009	63.8 (± 0.0492)	8	24.9 (± 0.0432)	4				
ML1-5	4732-26	3/9/2009	3/18-3/24/2009	62.5 (± 0.0356)	8	21.8 (± 0.0250)	4				
ML1.5	4732-26 Lab Dup	3/9/2009	3/18-3/24/2009	62.3 (± 0.0589) (RPD=0.321)	8	-	-				
ML1-6	4732-27	3/9/2009	3/18-3/24/2009	60.0 (± 0.0588)	8	8.04 (± 0.0315)	4				
ML1-7	4732-28	3/9/2009	3/18-3/24/2009	80.8 (± 0.0738)	8	9.90(± 0.0183)	4				
ML1-7	4732-28 Lab Dup	3/9/2009	3/18-3/24/2009	-	-	9.94(± 0.0282) (RPD=0.403)	4				
ML7-2	4744-1	3/9/2009	3/18-3/24/2009	4.74 (± 0.0234)	1	193 (± 0.0473)	20				
ML7-3	4744-2	3/9/2009	3/18-3/24/2009	24.0 (± 0.0126)	4	1180 (± 0.0444)	100				
ML7-4	4744-3	3/10/2009	3/18-3/24/2009	36.8 (± 0.0412)	4	242 (± 0.0345)	20				
ML7-5	4744-4	3/10/2009	3/18-3/24/2009	20.3 (± 0.0285)	4	343 (± 0.0822)	20				

EPA - General Parameters

Analytical Results Report

Laboratory:

General Parameters

Report Date:

03/25/09

Technical Directive:

EPAGP077

Analyst:

Kristie Hargrove

Analyst:	Kristie Hargrove		Analytes	Total Inorganic Carbon (TIC)		Total Organic Carbon (TOC)			
			Codes	7440-44-0-TIC		7440-44-0-TOC			
			Methods	RSKSOP-265 Rev. 3		RSKSOP-265 Rev. 3			
			Unit	mg/L		mg/L			
			MDL	0.025**		0.049**			
			QL	0.500**		0.500**			
Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Data	DF	Data	DF		
ML7-6	4744-5	3/10/2009	3/18-3/24/2009	37.6 (± 0.0146)	4	381 (± 0.0873)	20		
ML7-7	4744-6	3/10/2009	3/18-3/24/2009	90.3 (± 0.0364)	8	121 (± 0.2239)	20		
ML6-2	4744-7	3/10/2009	3/18-3/24/2009	32.1 (± 0.0166)	4	653 (± 0.0582)	40		
ML6-3	4744-8	3/10/2009	3/18-3/24/2009	57.2 (± 0.0220)	4	233 (± 0.1033)	20		
ML6-4	4744-9	3/11/2009	3/18-3/24/2009	53.3 (± 0.0423)	4	40.9 (± 0.0822)	10		
ML6-5	4744-10	3/11/2009	3/18-3/24/2009	23.3 (± 0.0369)	4	136 (± 0.0626)	10		
ML6-5	4744-10 Lab Dup	3/11/2009	3/18-3/24/2009	22.8 (± 0.0562) (RPD=2.17)	4	135 (± 0.0219) (RPD=0.738)	10		
ML6-6	4744-11	3/11/2009	3/18-3/24/2009	26.3 (± 0.0209)	4	107 (± 0.0429)	10		
ML6-7	4744-12	3/11/2009	3/18-3/24/2009	71.6 (± 0.0820)	4	68.2 (± 0.1600)	10		
ML4-2	4744-13	3/11/2009	3/18-3/24/2009	154 (± 0.0295)	8	78.5 (± 0.1732)	8		
ML4-3	4744-14	3/11/2009	3/18-3/24/2009	83.2 (± 0.0463)	8	36.6 (± 0.0751)	8		
ML4-4	4744-15	3/12/2009	3/18-3/24/2009	58.8 (± 0.0465)	8	13.1 (± 0.0559)	8		
ML4-5	4744-16	3/12/2009	3/18-3/24/2009	62.8 (± 0.0355)	8	10.3 (± 0.0356)	4		
ML4-5	4744-16 Lab Dup	3/12/2009	3/18-3/24/2009	-	-	10.4 (± 0.0187) (RPD=0.966)	4		
ML4-6	4744-17	3/12/2009	3/18-3/24/2009	64.9 (± 0.0186)	8	9.76 (± 0.0129)	4		
ML4-7	4744-18	3/12/2009	3/18-3/24/2009	97.3 (± 0.0645)	8	10.9 (± 0.0085)	4		
ML3-2	4744-19	3/13/2009	3/18-3/24/2009	131 (± 0.1294)	8	868 (± 0.0497)	100		
ML3-3	4744-20	3/13/2009	3/18-3/24/2009	49.6 (± 0.0435)	4	1130 (± 0.0273)	100		
ML3-4	4744-21	3/14/2009	3/18-3/24/2009	58.3 (± 0.0425)	4	220 (± 0.0225)	40		
ML3-4	4744-21 Lab Dup	3/14/2009	3/18-3/24/2009	57.9 (± 0.0319) (RPD=0.689)	4	222 (± 0.0016) (RPD=0.905)	40		
ML3-5	4744-22	3/14/2009	3/18-3/24/2009	122 (± 0.0537)	20	125 (± 0.0265)	20		
ML3-6	4744-23	3/14/2009	3/18-3/24/2009	118 (± 0.0206)	20	21.6 (± 0.0213)	10		
ML3-7	4744-24	3/14/2009	3/18-3/24/2009	63.6 (± 0.0325)	4	6.57 (± 0.0091)	10		

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set. The samples were diluted to accommodate the wide range of concentrations in the sample sets. The data values are reported with the dilution factors applied. MDL studies have been performed for the Phoenix 8000. The current MDL value is 0.025 mg/L for TIC range 0.1-20 mg/L performed on 1/30/2009, and 0.049 mg/L for TOC range 0.1-20 mg/L performed on 12/23/2008. ** The MDL and QL should be raised by the same factor as the dilution factor in the samples that were diluted.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (**DF**), if applicable.
2. " - " denotes that the information is not available or the analyte is not analyzed.

EPA - General Parameters

Analytical Results Report

Laboratory:

General Parameters

Work Request:

EPAGP077

Sample Results for Aqueous Samples

Analyst:

Lynda Callaway

Report Date:

04/01/09

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Analytes		Chloride (Cl)		Bromide (Br)		Sulfate (as SO ₄)		Fluoride (F)	
				Codes		16887-00-6		7726-95-6-BR		14808-79-8		7782-41-4	
				Methods		RSKSOP-288/2		RSKSOP-288/2		RSKSOP-288/2		RSKSOP-288/2	
				Unit		mg/L		mg/L		mg/L		mg/L	
				MDL		* 0.055		* 0.087		* 0.074		* 0.034	
				QL		* 1.00		* 1.00		* 1.00		* 0.200	
				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
PMW-3	4732-1	3/4/2009	3/23 & 3/24/09	78.3	6	BQL (0.442)	1	8.98	1	BQL (0.123)	1		
PMW-2	4732-2	3/4/2009	3/23 & 3/24/09	39.5	1	BQL (0.390)	1	31.5	1	BQL (0.166)	1		
Field Blank	4732-3	3/4/2009	3/23 & 3/24/09	ND	1	ND	1	ND	1	ND	1		
PMW-1	4732-4	3/4/2009	3/23 & 3/24/09	125	6	BQL (0.666)	1	11.1	1	BQL (0.076)	1		
Dup-1	4732-5	3/4/2009	3/23 & 3/24/09	125	6	BQL (0.648)	1	11.1	1	BQL (0.098)	1		
PMW-6	4732-6	3/4/2009	3/23 & 3/24/09	42.4	1	BQL (0.284)	1	26.7	1	BQL (0.152)	1		
PMW-5	4732-7	3/5/2009	3/23 & 3/24/09	274	6	BQL (0.678)	1	2.17	1	BQL (0.168)	1		
Dup-2	4732-8	3/5/2009	3/23 & 3/24/09	270	6	BQL (0.496)	1	1.82	1	BQL (0.064)	1		
Dup-2	4732-8 Lab dup	3/5/2009	3/23 & 3/24/09	267 (RPD=1.12)	6	BQL (0.440)(RPD=NA)	1	1.89 (RPD=3.77)	1	BQL (0.081)(RPD=NA)	1		
PMW-4	4732-9	3/5/2009	3/23 & 3/24/09	84.1	6	BQL (0.831)	1	56.6	6	BQL (0.050)	1		
ML 2-2	4732-10	3/5/2009	3/23 & 3/24/09	888	21	ND	1	BQL (0.873)	1	0.225	1		
ML 2-3	4732-11	3/5/2009	3/23 & 3/24/09	192	6	1.14	1	2.46	1	0.228	1		
ML 2-4	4732-12	3/6/2009	3/23 & 3/24/09	194	6	BQL (0.867)	1	5.19	1	BQL (0.167)	1		
ML 2-5	4732-13	3/6/2009	3/23 & 3/24/09	29.3	1	BQL (0.588)	1	28.8	1	0.210	1		
ML 2-6	4732-14	3/6/2009	3/23 & 3/24/09	58.1	6	BQL (0.509)	1	30.4	1	0.224	1		
ML 2-7	4732-15	3/6/2009	3/23 & 3/24/09	117	6	BQL (0.558)	1	29.4	1	0.257	1		
ML 5-2	4732-16	3/6/2009	3/23 & 3/24/09	468	21	BQL (0.142)	1	BQL (0.595)	1	BQL (0.055)	1		
ML 5-3	4732-17	3/6/2009	3/23 & 3/24/09	333	21	BQL (0.199)	1	BQL (0.730)	1	0.280	1		
ML 5-3	4732-17 Lab dup	3/6/2009	3/23 & 3/24/09	351 (RPD=5.26)	21	BQL (0.153)(RPD=NA)	1	BQL (0.678)(RPD=NA)	1	0.282 (RPD=0.712)	1		
Dup-3	4732-18	3/6/2009	3/23 & 3/24/09	331	21	ND	1	BQL (0.264)	1	0.227	1		
ML 5-4	4732-19	3/7/2009	3/23 & 3/24/09	49.1	1	BQL (0.917)	1	1.74	1	BQL (0.163)	1		
ML 5-5	4732-20	3/7/2009	3/23 & 3/24/09	72.0	6	BQL (0.680)	1	1.48	1	BQL (0.141)	1		
ML 5-6	4732-21	3/7/2009	3/23 & 3/24/09	91.8	11	BQL (0.557)	1	BQL (0.248)	1	0.215	1		
ML 5-7	4732-22	3/7/2009	3/23 & 3/24/09	133	11	BQL (0.769)	1	ND	1	0.237	1		
ML 1-2	4732-23	3/7/2009	3/23 & 3/24/09	200	6	BQL (0.805)	1	35.1	1	BQL (0.056)	1		
ML 1-3	4732-24	3/7/2009	3/23 & 3/24/09	83.8	6	BQL (0.964)	1	8.80	1	0.350	1		
ML 1-4	4732-25	3/9/2009	3/23 & 3/24/09	43.9	1	BQL (0.968)	1	32.8	1	0.248	1		
ML 1-5	4732-26	3/9/2009	3/23 & 3/24/09	39.0	1	1.13	1	29.6	1	0.292	1		
ML 1-6	4732-27	3/9/2009	3/23 & 3/24/09	97.8	6	BQL (0.699)	1	26.9	1	0.252	1		
ML 1-7	4732-28	3/9/2009	3/23 & 3/24/09	112	6	BQL (0.764)	1	11.0	1	0.394	1		
ML 1-7	4732-28 Lab dup	3/9/2009	3/23 & 3/24/09	111 (RPD=0.897)	6	BQL (0.747)(RPD=NA)	1	10.5 (RPD=4.65)	1	0.408 (RPD=3.49)	1		
ML 7-2	4744-1	3/9/2009	3/25 & 3/26/09	406	11	1.07	1	1.41	1	BQL (0.141)	1		
ML 7-3	4744-2	3/9/2009	3/25 & 3/26/09	248	11	BQL (0.733)	1	BQL (0.907)	1	BQL (0.133)	1		
ML 7-4	4744-3	3/10/2009	3/25 & 3/26/09	146	11	BQL (0.820)	1	ND	1	BQL (0.044)	1		
ML 7-5	4744-4	3/10/2009	3/25 & 3/26/09	260	11	BQL (0.761)	1	BQL (0.162)	1	ND	1		

EPA - General Parameters

Analytical Results Report

Laboratory:

General Parameters

Work Request:

EPAGP077

Sample Results for Aqueous Samples

Analyst:

Lynda Callaway

Report Date:

04/01/09

Field Sample ID	Lab Sample ID	Date Collected	Date Analyzed	Analytes		Chloride (Cl)		Bromide (Br)		Sulfate (as SO ₄)		Fluoride (F)	
				Codes		16887-00-6		7726-95-6-BR		14808-79-8		7782-41-4	
				Methods		RSKSOP-288/2		RSKSOP-288/2		RSKSOP-288/2		RSKSOP-288/2	
				Unit		mg/L		mg/L		mg/L		mg/L	
				MDL		* 0.055		* 0.087		* 0.074		* 0.034	
				QL		* 1.00		* 1.00		* 1.00		* 0.200	
				Data	DF	Data	DF	Data	DF	Data	DF	Data	DF
ML 7-6	4744-5	3/10/2009	3/25 & 3/26/09	246	11			BQL (0.823)	1	ND	1	BQL (0.134)	1
ML 7-7	4744-6	3/10/2009	3/25 & 3/26/09	214	11			BQL (0.795)	1	ND	1	0.307	1
ML 6-2	4744-7	3/10/2009	3/25 & 3/26/09	374	11			BQL (0.445)	1	BQL (0.749)	1	BQL (0.060)	1
ML 6-3	4744-8	3/10/2009	3/25 & 3/26/09	261	11			BQL (0.571)	1	BQL (0.213)	1	0.317	1
ML 6-4	4744-9	3/11/2009	3/25 & 3/26/09	57.1	11			BQL (0.576)	1	ND	1	BQL (0.127)	1
ML 6-5	4744-10	3/11/2009	3/25 & 3/26/09	211	11			BQL (0.749)	1	BQL (0.085)	1	ND	1
ML 6-5	4744-10 Lab dup	3/11/2009	3/25 & 3/26/09	212 (RPD=0.473)	11			BQL (0.611)(RPD=NA)	1	ND (RPD=NA)	1	ND (RPD=NA)	1
ML 6-6	4744-11	3/11/2009	3/25 & 3/26/09	204	11			BQL (0.736)	1	ND	1	BQL (0.102)	1
ML 6-7	4744-12	3/11/2009	3/25 & 3/26/09	198	11			BQL (0.662)	1	ND	1	BQL (0.182)	1
ML 4-2	4744-13	3/11/2009	3/25 & 3/26/09	400	11			BQL (0.902)	1	BQL (0.351)	1	0.246	1
ML 4-3	4744-14	3/11/2009	3/25 & 3/26/09	183	11			1.01	1	BQL (0.364)	1	0.282	1
ML 4-4	4744-15	3/12/2009	3/25 & 3/26/09	43.6	11			BQL (0.680)	1	27.1	1	0.309	1
ML 4-5	4744-16	3/12/2009	3/25 & 3/26/09	62.5	11			BQL (0.581)	1	11.1	1	0.293	1
ML 4-6	4744-17	3/12/2009	3/25 & 3/26/09	69.1	11			BQL (0.951)	1	8.18	1	0.241	1
ML 4-7	4744-18	3/12/2009	3/25 & 3/26/09	79.1	11			BQL (0.520)	1	3.48	1	0.344	1
ML 3-2	4744-19	3/13/2009	3/25 & 3/26/09	124	11			1.82	1	BQL (0.880)	1	0.320	1
ML 3-3	4744-20	3/13/2009	3/25 & 3/26/09	91.7	11			1.52	1	1.32	1	BQL (0.099)	1
ML 3-3	4744-20 Lab dup	3/13/2009	3/25 & 3/26/09	90.2 (RPD=1.65)	11			1.64 (RPD=7.59)	1	1.33 (RPD=0.755)	1	BQL (0.111)(RPD=NA)	1
ML 3-4	4744-21	3/14/2009	3/25 & 3/26/09	32.4	1			BQL (0.856)	1	BQL (0.881)	1	0.288	1
ML 3-5	4744-22	3/14/2009	3/25 & 3/26/09	41.8	1			1.10	1	BQL (0.385)	1	0.295	1
ML 3-6	4744-23	3/14/2009	3/25 & 3/26/09	89.8	11			1.19	1	ND	1	BQL (0.182)	1
ML 3-7	4744-24	3/14/2009	3/25 & 3/26/09	153	11			1.06	1	1.16	1	0.351	1
ML 3-7	4744-24 Lab dup	3/14/2009	3/25 & 3/26/09	151 (RPD=1.32)	11			1.12 (RPD=5.50)	1	1.12 (RPD=3.51)	1	0.341 (RPD=2.89)	1

Comments:

The data quality objective for the precision of sample duplicates is a relative percent difference of <10. This precision objective was met for the duplicate samples in this sample set within the calibration ranges. *MDL and QL should be raised by the same factor as the dilution factor for those samples that were diluted. The MDLs were determined on 8/14/2008.

Notes:

1. If the parameter was detected above the quantitation limit (**QL**), the numeric result is reported; **BQL** denotes that the parameter was not detected at or above the quantitation limit; **BQL ()** denotes that the parameter was detected above the method detection limit (**MDL**) but below **QL** and the estimated numeric result is reported in parenthesis; **ND** denotes that the parameter was not detected at all; **NA** means not applicable; **NSF** means not sufficient amount for analyses. All the results are corrected with dilution factors (**DF**), if applicable.

2. " - " denotes that the information is not available or the analyte is not analyzed.

Client EPA
Project name # Paris Island/Nano Iron for Source Zones
OU Project Ref. # 341
Number/Type of Samples 7 water samples
Analysis Required d13C of DCEs, TCE, PCE
Date Received Mar-10-2009
Date Analysis Completed Mar-26-2009

Notes

"corrected $\delta^{13}\text{C}$ ": the correction [X] accounts for the method bias, based on the external standard runs, see QAQC data below.

"corrected $\delta^{13}\text{C}$ " should be used to compare data from different sampling events

na/nd=peak not acquired (above quantitation limit, if so the sample was rerun with higher dilution x) or compound not detected

nd=peak not detected

values highlighted green: precision/accuracy reduced to ± 1 permil due to low signal

Replicate Runs

run #	sample ID	dilution x	$\delta^{13}\text{C} \text{ ‰}$				
			11DCE	t-DCE	c-DCE	TCE	PCE
4794	DUP-2	417	na/nd	-39.4	na/nd	na/nd	na/nd
4808	DUP-2	63	-37.9	-39.5	na/nd	na/nd	na/nd
4819	DUP-2	12500	na/nd	na/nd	-27.7	-26.8	-27.7
4825	DUP-2	12500	na/nd	na/nd	-27.3	-27.3	-27.5
4773	ML2-3	12500	na/nd	na/nd	-25.2	na/nd	na/nd
4774	ML2-3	500	na/nd	na/nd	na/nd	coel	na/nd
4805	ML2-3	42	-37.3	-38.5	na/nd	na/nd	na/nd
4814	ML2-3	17	-37.4	na/nd	na/nd	na/nd	na/nd
4821	ML2-3	12500	na/nd	na/nd	-24.8	na/nd	na/nd
4827	ML2-3	500	na/nd	na/nd	na/nd	coel	na/nd
4777	ML2-5	8333	na/nd	na/nd	na/nd	-31.6	na/nd
4778	ML2-5	2500	na/nd	na/nd	-29.2	-31.9	na/nd
4795	ML2-5	8	-43	-41.8	na/nd	na/nd	na/nd
4815	ML2-5	4	-42.8	-40.7	na/nd	na/nd	na/nd
4822	ML2-5	25000	na/nd	na/nd	na/nd	na/nd	-28.4
4770	ML5-3	1000	na/nd	na/nd	-6.7	na/nd	na/nd
4810	ML5-3	192	na/nd	-24.5	na/nd	na/nd	na/nd
4816	ML5-3	192	na/nd	-24.8	na/nd	na/nd	na/nd
4828	ML5-3	13	na/nd	na/nd	na/nd	-39.7	na/nd
4767	ML5-5	8333	na/nd	na/nd	-24.8	na/nd	na/nd
4796	ML5-5	21	-36.5	-37.5	na/nd	na/nd	na/nd
4830	ML5-5	42	-36.1	-36.9	na/nd	-40.8	na/nd
4762	PMW-3	167	na/nd	na/nd	na/nd	-31.1	-23.5
4781	PMW-3	8333	na/nd	na/nd	-24.8	na/nd	na/nd
4782	PMW-3	167	na/nd	na/nd	na/nd	-30.4	-23.5
4788	PMW-3	167	na/nd	na/nd	na/nd	-30.3	-24
4804	PMW-3	56	na/nd	-35.8	na/nd	na/nd	na/nd
4813	PMW-3	42	na/nd	-35.8	na/nd	na/nd	na/nd
4824	PMW-3	5000	na/nd	na/nd	-24.8	na/nd	na/nd
4768	PMW-5	4167	na/nd	na/nd	na/nd	-27.2	-27.5
4769	PMW-5	10000	na/nd	na/nd	-27.2	-27.5	-27.3
4790	PMW-5	278	na/nd	-39.7	na/nd	na/nd	na/nd
4797	PMW-5	42	-38.1	na/nd	na/nd	na/nd	na/nd
4803	PMW-5	83	-38.2	-39.5	na/nd	na/nd	na/nd

Averages

sample ID	$\delta^{13}\text{C} \text{ ‰}$				
	11DCE	t-DCE	c-DCE	TCE	PCE
DUP-2	-37.9	-39.5	-27.5	-27.1	-27.6
ML2-3	-37.4	-38.5	-25.0	coel	nd
ML2-5	-42.9	-41.3	-29.2	-31.8	-28.4
ML5-3	nd	-24.7	-6.7	-39.7	nd
ML5-5	-36.3	-37.2	-24.8	-40.8	nd
PMW-3	nd	-35.8	-24.8	-30.6	-23.7
PMW-5	-38.2	-39.6	-27.2	-27.4	-27.4

Averages, corrected

	corrected $\delta^{13}\text{C} \text{ ‰}$		
	c-DCE	TCE	PCE
DUP-2	-27.5	-27.1	-27.6
ML2-3	-25.0	coel	nd
ML2-5	-29.2	-31.8	-28.4
ML5-3	-6.7	-39.8	nd
ML5-5	-24.8	-40.9	nd
PMW-3	-24.8	-30.7	-23.7
PMW-5	-27.2	-27.4	-27.4

QAQC – precision

sample ID	stdev of replicate $\delta^{13}\text{C} \text{ ‰}$				
	11DCE	t-DCE	c-DCE	TCE	PCE
DUP-2		0.1	0.3	0.4	0.1
ML2-3	0.1		0.3		
ML2-5	0.1	0.8		0.2	
ML5-3		0.2			
ML5-5	0.3	0.4			
PMW-3		0.0	0.0	0.4	0.3
PMW-5	0.1	0.1		0.2	0.1

QAQC – external standards

run #	sample ID	$\delta^{13}\text{C} \text{ ‰}$		
		c-DCE	TCE	PCE
4765	standard	-26.2	-30.5	-27.0
4772	standard	-26.5	-30.7	-27.0
4780	standard	-26.2	-30.4	-26.8
4787	standard	-26.0	-30.8	-27.2
4792	standard	-25.8	-30.6	-26.6
4802	standard	-25.9	-30.6	-27.2
4809	standard	-25.8	-30.5	-27.2
4818	standard	-26.1	-30.7	-27.3
4820	standard	-26.0	-30.9	-27.3
4823	standard	-26.1	-30.5	-27.0
average $\delta^{13}\text{C}$		-26.1	-30.6	-27.1
max stdev n=2		0.5	0.4	0.5
off-line $\delta^{13}\text{C}$ of Std compound		-26.1	-30.7	-27.1
correction [x]		0.0	-0.1	0.0

Client EPA
Project name # Paris Island/Nano Iron for Source Zones
OU Project Ref. # 341a
Number/Type of Samples 7 water samples
Analysis Required d13C of ethane, ethene, VC
Date Received Mar-10-2009
Date Analysis Completed Apr-8-2009

Notes

"corrected $\delta^{13}\text{C}$ ": the correction [X] accounts for the method bias, based on the external standard runs, see QAQC data below.
 "corrected $\delta^{13}\text{C}$ " should be used to compare data from different sampling events

Notes: na/nd—peak not acquired (above quantitation limit, if so the sample was rerun with higher dilution x) or compound not detected

Replicate Runs

run #	sample ID	dilution x	$\delta^{13}\text{C} \text{ ‰}$		
			ethene	ethane	VC
4844	DUP-2	1000	-36.1	-43.6	-25.8
4843	ML2-3	4167	-37.7	na/nd	-26.3
4841	ML2-3	2500	-37.6	na/nd	-26.1
4857	ML2-3	1000	na/nd	-44.5	na/nd
4851	ML2-5	100	-37.9	-42.8	-24.1
4846	ML2-5	50	-38.3	-42.8	-23.7
4837	ML5-3	5000	-31.3	na/nd	-9.0
4847	ML5-3	4167	-31.2	na/nd	-9.0
4856	ML5-3	625	na/nd	-46.2	na/nd
4860	ML5-3	625	na/nd	-45.8	na/nd
4848	ML5-5	1250	-37.1	na/nd	-31.4
4838	ML5-5	1000	-37.0	na/nd	-31.4
4858	ML5-5	500	na/nd	-41.8	na/nd
4862	ML5-5	500	na/nd	-42.0	na/nd
4850	PMW-3	1000	-33.6	na/nd	-31.1
4842	PMW-3	500	-33.8	na/nd	-30.8
4863	PMW-3	417	na/nd	-42.5	na/nd
4839	PMW-5	1000	-36.0	-43.6	-26.1

Averages

sample ID	$\delta^{13}\text{C} \text{ ‰}$		
	ethene	ethane	VC
DUP-2	-36.1	-43.6	-25.8
ML2-3	-37.7	-44.5	-26.2
ML2-5	-38.1	-42.8	-23.9
ML5-3	-31.3	-46.0	-9.0
ML5-5	-37.1	-41.9	-31.4
PMW-3	-33.7	-42.5	-31.0
PMW-5	-36.0	-43.6	-26.1

Averages, corrected

sample ID	corrected $\delta^{13}\text{C} \text{ ‰}$	
	ethene	VC
DUP-2	-36.0	-25.4
ML2-3	-37.5	-25.8
ML2-5	-38.0	-23.5
ML5-3	-31.1	-8.6
ML5-5	-36.9	-31.0
PMW-3	-33.6	-30.6
PMW-5	-35.9	-25.7

QAQC – external standards

run #	sample ID	$\delta^{13}\text{C} \text{ ‰}$	
		ethene	VC
4835	standard	-29.4	-28.3
4836	standard	-29.4	-28.7
4840	standard	-29.5	-28.4
4845	standard	-29.3	-28.3
4849	standard	-29.4	-28.3
4854	standard	-29.3	-28.5
4859	standard	-29.1	-28.2
average $\delta^{13}\text{C}$		-29.3	-28.4
max stdev n=2		0.3	0.4
off-line $\delta^{13}\text{C}$ of Std compound		-29.2	-28.0
correction [x]		0.1	0.4

QAQC – precision

sample ID	stdev of replicate $\delta^{13}\text{C} \text{ ‰}$		
	ethene	ethane	VC
ML2-3	0.1		0.1
ML2-5	0.3	0.0	0.3
ML5-3	0.1	0.3	0.0
ML5-5	0.1	0.1	0.0
PMW-3	0.1		0.2

APPENDIX F
EZVI INJECTION REPORTS

PNEUMATIC FRACTURING, INC REPORT, FEBRUARY 16, 2007

**PNEUMATIC FRACTURING/PNEUMATIC INJECTION
AT THE
SWMU-45 SITE
PARRIS ISLAND MARINE DEPOT
PARRIS ISLAND, SOUTH CAROLINA**

Proposal No. 2006-023

Prepared for:



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16 February 2007

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1.0 INTRODUCTION

Pneumatic Fracturing, Inc. (PFI) was retained by GeoSyntec Consultants, Inc. (GeoSyntec) to perform pneumatic fracturing (PF) and pneumatic liquid injection (PLI) at Solid Waste Management Unit (SWMU) 45 at the Marine Corps Recruit Depot (MCRD) at Parris Island, South Carolina (Site). The objective of the field activities was to demonstrate the pneumatic injection methodology of emulsified zero valent iron (EZVI) as part of the Environmental Security Technology Demonstration Program (ESTCP). To accomplish this, PFI utilized pneumatic fracturing as an enhancement of the permeability of the geologic formation prior to the pneumatic liquid injection of EZVI. The EZVI injection is intended to facilitate Chlorinated Volatile Organic Compounds (CVOC) mass reduction and enhance naturally occurring biodegradation/dechlorination processes. The Target Zone was designed with five injection points, located near the northern wall of the demolished building (Building 193) which was situated at SWMU-45 (Figure 1) and within an existing monitoring well network.

The purpose of this report is to document the field activities conducted at the Site. The sections of this report present the following:

- a description of the site background, geology and hydrogeology (Section 2.0);
- a description of the field activities (Section 3.0);
- a summary of results from pneumatic fracturing/pneumatic injection activities, including observed radius of influence (Section 4.0); and
- conclusions (Section 5.0).

2.0 BACKGROUND

2.1 GEOLOGY

The geology in the area of pneumatic fracturing/pneumatic injection activities is composed of a fine to medium, permeable sand from the surface to 17 feet below ground surface (bgs). Thin, discontinuous lenses of silty clay are also encountered in this range. A layer of peat exists from 17 to 21 feet bgs, which is underlain by clay. Field activities were conducted in the vicinity of the demolished building which is immediately underlain by fill material.

2.2 HYDROGEOLOGY

Water table elevations range from three to five feet above sea level. The groundwater flow direction is generally to the southeast.

2.3 SITE BACKGROUND AND CONTAMINANTS

The location of the SWMU-45 site is in the vicinity of the former dry cleaning facility at Building 193. Contaminants of concern (COCs) include tetrachloroethene, trichloroethene (TCE), dichloroethene (DCE), and vinyl chloride (VC). A network of wells exist at the site to monitor the groundwater and to evaluate the performance of the injection demonstration, including five monitoring wells (labeled MW-), seven multi-level wells (labeled ML-) and five pressure monitoring wells (labeled PMW-), all within 20 feet of the target area.

2.4 PREVIOUS ACTIVITIES AT SWMU-45

The SWMU-45 site is in the location of the former Morale, Welfare, and Recreation (MWR) Dry Cleaning Facility, Building 193, Marine Corps Recruit Depot (MCRD), Parris Island, South Carolina. Four above ground storage tanks were situated along the northern side of former Building 193. The tanks were installed in 1988 to replace underground storage tanks. The location and capacity of the underground storage system are not known. The new storage tanks

were positioned within a concrete catch basin used to contain any overflow during tank filling. It was reported that on 11 March 1994 that one of the tanks was overfilled with PCE. An unknown amount of the contaminant flowed into the concrete catch basin. The PCE overflow was not collected at that time, and heavy rainfall subsequently washed the contaminant onto the surrounding soil. The exact dates of operation of former Building 193 are unknown (Tetra Tech NUS, 2004b).

3.0 DESCRIPTION OF FIELD ACTIVITIES

3.1 OVERVIEW OF PROGRAM

PFI was contracted to demonstrate pneumatic fracturing/pneumatic liquid injection (PF/PLI) at five injection points (IP-1, IP-2, IP-3, IP-4, and IP-5) within the target area, to enhance the permeability of subsurface soils prior to the co-injection of EZVI. Fractures and injection would be performed utilizing PFI's proprietary 90 degree directional nozzle, which has successfully been used to inject EZVI prior to this demonstration.

The objective of the field activities is to determine the efficiency of distributing the EZVI without damage to the emulsion; significantly reduce the mass flux of VOCs from the source zone; and reduce the Dense Non-Aqueous Phase Liquid (DNAPL) mass in the source zone. Additionally, the technology will be evaluated based on the level of complexity and cost for field-scale implementation.

3.2 PLANNING, PREPARATION, AND MOBILIZATION

This task included planning and preparation required for the implementation of field activities. Preparation activities included the preparation of a Health & Safety Plan (HASP); discussions with GeoSyntec regarding the injection plot; layout of PFI equipment; scheduling of the nitrogen supplier; and discussions with the driller. The following vendors were required for field activities at SWMU-45: 1.) nozzle installation and injection point completion were conducted by Vironex, LLC of North Carolina and directly subcontracted by GeoSyntec; and 2.) National Welders Supply Company from Charlotte, North Carolina supplied the nitrogen tube trailer. One nitrogen trailer was staged on site. The supply of EZVI was mixed and supplied by GeoSyntec.

PFI personnel arrived at the site on 11 October 2006 to mobilize the injection equipment and initiate site activities. The regulator valve assembly and control panel were assembled and installed on the nitrogen trailer and the mechanicals were leak tested to ensure that no damage occurred during shipment to the site. During inspection, a flange on the injection skid was

observed to have developed a crack during transport and required repair, which was corrected prior to injection activities. Additionally, PFI's injection hose were damaged during transport, requiring confirmation from PFI's hose supplier that the hose was still safe based on the damage. PFI repaired the hose based on the manufacturer's recommendations. The nozzle casing was prepared and measured to ensure accurate target depths during injection and installed by Vironex. Additional set-up activities included installation of the floats on PFI's injection skid to monitor volumes injected; the assembly of a "straw" to easily remove the EZVI from the drums; calibration and op testing of all fracturing and injection equipment.

As part of the initiation of site activities, PFI assembled, calibrated and temporarily installed pressure relief valves (PRV) and gauges at fifteen surrounding wells (PMW-1, PMW-2, PMW-3, PMW-4, PMW-5, PMW-6, ML-1, ML-2, ML-3, ML-4, ML-5, ML-6, ML-7, MW-08SU, and MW-24SU) to measure pressure influence and provide a vent for excessive pressure release of nitrogen during PF/PLI activities. The PRVs were connected to hoses, which were further directed to a drum. The function of the PRVs was to relieve and direct groundwater and/or nitrogen to a container in the event that fracturing/injection activities caused the wells to evacuate. The purpose of the pressure gauges and Magnehelics was to document pressure influence during PF/PLI activities. Retrofitting of the wells with the PRV installation was conducted on 13 October 2006, upon the completion of a pump-test, during which the monitoring wells had to remain sealed. Retrofitting of the wells included removing concrete and bentonite from the annular space to secure slip by thread caps; securing line for suspension of GeoSyntec's Leveloggers at four locations; using a dremel tool to shave PVC to retrofit the caps; and add QuikCrete in the annular space of the wells to minimize potential blow-by.

Additionally, surface monitoring equipment was set up to monitor heave. Monitoring included the arrangement of eight electronic biaxial tiltmeters, as well as heave rods and a surveying transit.

3.3 TARGET ZONE

The PF/PLI at SWMU-45 was completed from 14 October 2006 to 17 October 2006. The target area included five injection points arranged to cover an area of 15 feet by 10 feet. Injections were initially scheduled to be performed from 6 to 18 feet bgs and the vertical spacing for fracturing/injection was typically at two foot intervals. At IP-1, IP-2, IP-3 and IP-4, the target depths included injection in one direction, from 17.5 feet bgs to 7.5 feet bgs. At IP-5, the target depths included injection in four directions, from 18.5 feet bgs to 6.5 feet bgs.

3.3.1 Injection Point Installation

Vironex installed the five injection points, designated IP-X, where X indicates the number of the injection point. Injection points IP-1, IP-2, IP-3 and IP-4 were installed on 12 October 2006; IP-5 was installed on 15 October; and IP-10 was added to the project and installed on 17 October. Injection points were installed using a Geoprobe 6610 to drive PFI's three inch casing and directional nozzle.

Following the removal of the injection nozzle, Vironex completed each injection point by grouting the remaining hole with concrete bentonite slurry mix.

3.3.2 PF/PLI Activities

A two-step pneumatic injection procedure was executed at each depth interval. First, the formation was pneumatically fractured using nitrogen discharged through the directional nozzle. Fracturing was employed in an attempt to create horizontal fractures and fluidize a selected target depth where the EZVI could be delivered. The fracturing and injection were completed using a concentric injection casing and nozzle.

The injection nozzle is designed to deliver a 90 degree pattern of nitrogen gas during fracturing or liquid during injection. The nozzle can be rotated in the ground to target different directions at the same depth interval. A burst of nitrogen gas is delivered below ground to generate a path

for subsequent liquid injection. After a metered amount of liquid was injected, the nozzle was withdrawn 2 feet to a shallower depth interval. This process is then repeated until all target depths and directions have been addressed.

It was originally projected that 104,000 cubic feet of nitrogen would be required to complete all injections. Additionally, the injection activities were scheduled to be completed in two days, beginning on 13 October 2006.

3.4 MONITORING

PFI monitored the immediate and surrounding vicinity of the PF/PLI field activities. The immediate vicinity of the injection point was visually monitored for heave and daylighting. Each surrounding well was monitored for pressure influence, and real-time performance monitoring was conducted by recording well influence during each injection. Monitoring wells within 20 feet from the active injection point were fitted with pressure gauges and Magnehelics to monitor any immediate influence during injection.

Fracture initiation, maintenance, and injection pressures were logged during all injection events. All measurements pertaining to fracture initiation and maintenance at the injection points were collected utilizing a pressure transducer located at the nitrogen control manifold during PF activities. A pressure transducer down line of the injection skid monitored maintenance and injection pressure during PLI. Data collected from these transducers was visually observed in graphic format using WinDaq software. This enabled PFI to determine and monitor formation pressure during PF and PLI. Monitoring data from each fracture/injection is presented in Table 1 while graphic data is provided in Appendix A.

3.4.1 Pressure Influence

The radius of influence of PF/PLI activities can be interpolated from pressure influence observed at nearby monitoring wells. Influence and inter-connection between the injection point and nearby wells was measured by monitoring pressure indicated on gauges affixed to surrounding monitoring wells. Fifteen wells fitted with 25 psi pressure relief vents (PMW-1, PMW-2, PMW-3, PMW-4, PMW-5, PMW-6, ML-1, ML-2, ML-3, ML-4, ML-5, ML-6, ML-7, MW-08SU, and MW-24SU) were directed to a drum which collected groundwater in the event of evacuation. Their respective pressure influences are documented in the pressure log table located in Table 2.

3.4.2 Surface Monitoring

PFI continuously monitored the fracturing area for surface heave and evidence of daylighting to represent the effects of fracturing at the surface. A graduated heave rod was positioned near the injection point and monitored using a surveyor's level. Initial measurements were recorded prior to each fracture/injection. Pre- and post-injection measurements were logged to identify if any residual heave occurred during field activities. Maximum heave measurements were recorded during each fracture/injection and evidence of daylighting was monitored. Surface heave monitoring data is included in Table 3.

Bi-axial tiltmeters were positioned during field activities to monitor bi-directional movement or tilt of the ground surface. Eight tiltmeters were arranged around the injection plot and were monitored real time for excessive axial heave. A data-logger unit connected to a computer was used to perform real-time monitoring of surface heave. The LoggerNet software also supports alarm levels, such that heave observed at any tiltmeter in excess of 0.5 degree or 1 degree would trigger a strobe for low or high alarm, respectively. Real-time monitoring assists in confirming the direction of the injection nozzle as well as determining excessive heave or subsidence during injection activities. The cumulative data collected during each day of injection was used to generate a surface heave map, representative of the surface heave observed with the tiltmeter matrix. Results of the tiltmeter data are presented in Appendix B.

IP-1 and IP-3 were injected on the same day so a combined tiltmeter graph for the day was collected. IP-2 and IP-4 were also injected the same day but the files were separately downloaded to allow individual observations of each injection point. The tiltmeters were not run the day IP-5 and IP-10 were injected. This was due to the weather (i.e., threat of rain), and more importantly, the drill rig was limited by the tiltmeters and cables to access the injection points.

3.5 DEMOBILIZATION

PFI completed field activities on 18 October 2006. Upon completion of field activities, PFI removed all pressure gauges and PRVs from surrounding wells. PFI's injection nozzles were removed and decontaminated. Associated injection equipment and miscellaneous tools used during injection activities were decontaminated using biodegradable soap and a pressure washer prior to demobilization from the site.

3.6 DEVIATIONS FOR SCHEDULED PF/PLI ACTIVITIES

Several events occurred during PF/PLI activities that deviated from the original scope of work. These events included the following:

1. The initial scope of work specified that PF/PLI activities would occur from 6 to 18 feet bgs. Due to significant daylighting during injections at shallower intervals, three injection points were abandoned before their completion. During injection at IP-1 and IP-2, daylighting was observed in the vicinity of PMW-5. During injection at IP-3, and IP-4, daylighting was observed in the vicinity of ML-3 and PMW-2. During injection at IP-5, daylighting was observed in the vicinity of PMW-6. IP-1 was abandoned after injection at 11.5 feet bgs, IP-5 was abandoned after injection at 14 feet bgs, and IP-10 was abandoned after injection at 15 feet bgs.
2. The initial scope of work specified that two foot vertical intervals would be utilized for all fractures/injections. On certain injection intervals at IP-2 and IP-5, the target depth was altered to accommodate two criteria: 1.) to offset the injection depths of adjacent

injection points in the region where a preferential pathway existed, which was evident by short-circuiting during injection; and 2.) to stagger the depths injected at each injection point to obtain a more even vertical distribution of EZVI during injection.

3. The initial scope of work specified that 15 gallons of EZVI be injected per interval, per direction at the perimeter points, and 17 gallons be injected per interval, per direction at the center point. All injections were changed to 16 gallons per injection except for IP-4. Ten gallons per injection were projected for IP-4 based on sampling results indicating lower concentrations of contaminants in the northernmost corner of the injection plot.
4. Pressure observations and daylighting indicated significant influence at the site. Monitoring well PRVs were initially set for 25 psi, in an attempt to prevent fractures from short-circuiting to these surrounding wells, and also to maintain the integrity of the construction of the existing multi-level and monitoring well system. During injection at IP-1, pressure influence at ML-2 and PMW-5 of 5 psi was followed by daylighting in that area. Due to the short-circuiting observed at IP-1, the PRVs at the surrounding monitoring wells were dialed to zero, allowing any subsurface pressures to be relieved and to prevent short-circuiting at later injections. During injection at IP-3, pressure influence at ML-3 of 9.2 psi was followed by daylighting adjacent to the well. Due to this short-circuiting seen at IP-3, multi-level wells fitted with PRVs were also dialed to zero.
5. The original scope of work specified the injection of 850 gallons of EZVI. Due to complications with daylighting and short-circuiting, the total volume injected was 508 gallons.
6. The original scope of work estimated 104,000 cubic feet of nitrogen gas in order to complete all injection activities. Due to the short-circuiting experienced during injections, the amount of nitrogen used to initiate the fracture and the co-injection of nitrogen during EZVI injections was minimized. Additionally, the shorter duration of injections, the reduced injection volume and the reduction in the number of injections performed were also a factor in the decreased volume.

7. Injection activities were estimated to be completed in two days. The formation and the construction of the monitoring system disallowed the ability to complete the schedule of injections in a given period because the formation needed to settle between injection points (i.e., allow the nitrogen to dissipate in the formation). Therefore, injection activities were completed in four days where PFI actually performed injections in three days. (Note: PFI did not inject on 15 October 2006 since Vironex was completing their demonstration activities which precluded PFI's ability to inject since Vironex was providing support to PFI).
8. Due to daylighting at IP-5, an additional point was installed in an attempt to circumvent the apparent preferential pathway between IP-5 and PMW-6. At IP-10, injection depths were offset by six inches from the injection intervals at IP-5. Twenty-seven gallons were estimated per injection at IP-10 since the location of IP-10 was in an area of high concentrations of VOCs. At IP-10, EZVI was injected to capacity, which is to say that injection continued until daylighting was observed.
9. The tiltmeter monitoring was not originally included as part of the scope of activities. However, PFI decided that valuable information can be attained for surface monitoring and had positioned the tiltmeters in an array surrounding the injection plot.

4.0 SUMMARY OF RESULTS

4.1 PNEUMATIC FRACTURING/PNEUMATIC INJECTION

A total of 32 fracture/injection events were attempted or completed at six injection locations, from 14 October to 17 October 2006: four events at IP-1, six events at IP-2, six events at IP-3, six events at IP-4, seven events at IP-5, and three events at IP-10. The locations of the injection points are depicted on Figure 1. Approximately 2,714 cubic feet of nitrogen were used to enhance the permeability of the formation, create a network of subsurface soil fractures and deliver the EZVI into the fractures. The depth of treatment ranged between 7 and 18.5 feet bgs. Table 1 summarizes the pertinent information related to the PF/PLI program with the following variables: PF/PLI depths, injection pressures and flows, volumes injected, duration of injection, and observations.

PF/PLI was attempted at IP-1 at four intervals on 14 October 2006 from the deepest interval (17.5 feet bgs) upward, targeting the injection nozzle at two foot intervals. IP-1 was abandoned after the injection of 70 gallons of EZVI. IP-2 was completed on 16 October 2006, after PF/PLI was performed at six intervals from 17.5 to 7 feet bgs. A total of 96 gallons of EZVI were injected at IP-2. IP-3 was completed on 14 October 2006, after PF/PLI was performed at six intervals from 17 to 7 feet bgs. A total of 96 gallons of EZVI were injected at IP-3. IP-4 was completed on 16 October 2006, after PF/PLI was performed at six intervals from 17.5 to 7.5 feet bgs. A total of 60 gallons of EZVI were injected at IP-4. PF/PLI was attempted at IP-5 at three intervals on 17 October 2006 from 18.5 to 14 feet bgs. IP-5 was abandoned after the injection of 105 gallons of EZVI. A total of 81 gallons of EZVI were injected at IP-10, over 3 intervals from 18 to 15 feet bgs. IP-10 was abandoned due to daylighting on 17 October 2006. The starting pressures at the nitrogen trailer ranged between 2,500 and 1,990 psi. Nitrogen gas flow rates averaged 72.7 cubic feet per minute (scfm) per fracture/injection and the duration of the combined fracturing and injection processes was typically 1.17 minutes.

Fractures conducted prior to or during injection events ranged between 2 and 10 seconds. The readings obtained from the pressure transducer located at the nitrogen trailer indicated that fracture initiation pressures ranged between 19 and 79 psi.

The duration of EZVI injections ranged between 36 seconds and 4:02 minutes. Injection volumes per event spanned between 9 and 27 gallons with an average flow rate of 13.6 gallons per minute (gpm).

4.2 RADIUS OF INFLUENCE

Pressure influence was measured at surrounding wells to determine potential pathways of fracturing and injection activities; the results of which are discussed in the following sections and are organized by Injection Point and subsequently by fracture number.

Pressure Influence

Pressure influence data of surrounding wells during PF/PLI activities are presented on Table 2. The table contains pressure gauge readings and observations at nearby wells. Monitoring wells within 20 feet of the target area were monitored during PF/PLI activities.

Pressure influence is not an indication of actual radius of influence of either the fracture gas or the injected liquid, but represents potential connectivity between well locations based on depth and influence on the aquifer. This is indicative of wells which exhibited influence at some fracture depths but not at others.

4.2.1 IP-1

Pressure influence was visually observed or measured at the following locations during PF/PLI activities at IP-1:

- MW-24SU (~10 feet South) – measurable pressure influence was observed during only the first fracture interval;
- PMW-5 (~6 feet Southeast) - measurable pressure influence was observed at all depths; and
- ML-2 (~5.5 feet Northeast) – measurable pressure influence was observed at all depths.

The estimated radius of influence from pressure readings on surrounding wells was approximately 7 feet at IP-1. Short-circuiting and daylighting of EZVI was observed approximately 5 feet South of IP-1.

Well	Distance (ft from IP-1)	Injection Depth (ft bgs)			
		17.5	15.5	13.5	11.5
MW-24SU	10	X		NR	
PMW-5	6.25	X	X	NR	X
ML-2	5.5	X	X	NR	X
X : Measurable pressure x : Some gas or odor NR: No Reading					

4.2.2 IP-2

Pressure influence was visually observed or measured at the following locations during PF/PLI activities at IP-2:

- ML-2 (~13.25 feet North) – minimal pressure influence was observed at deeper intervals and measurable pressure influence was observed during injection at 15.5 feet bgs;

- ML-4 (~10.5 feet Northeast) – minimal pressure influence was observed at all depths; and
- ML-7 (~2.25 feet Northeast) – minimal pressure influence was observed at all depths and measurable pressure influence was observed during injections at 15.5 and 9 feet bgs.

The estimated radius of influence from pressure readings on surrounding wells for IP-2 would be approximately 7 feet. Measurable pressure influence (2 psi at ML-2) in the direction of the injection was observed as far as 13 feet away.

Well	Distance (ft from IP-2)	Injection Depth (ft bgs)					
		17.5	15.5	13	11	9	7
ML-7	2.25	x	X	x	x	X	
MW-24SU	3.25	x	x				
ML-6	5			x	x	x	
PMW-5	6					x	
PMW-4	6.75	x			x	x	
ML-5	7.25						
PMW-3	8.5		x	x			
ML-4	10.5	x	x	x	x	x	
PMW-6	11.25						x
ML-2	13.25	x	X	x			
ML-3	13.5	x	x		x		
PMW-2	19.25	x					
AMW-3	22.5	x					
X : Measurable pressure x : Some gas or odor							

4.2.3 IP-3

Pressure influence was visually observed or measured at the following locations during PF/PLI activities at IP-3:

- ML-3 (~2.25 feet South) – measurable pressure influence was observed during injection at all depths;
- ML-6 (~10 feet Southwest) – minimal pressure influence was observed at all depths; and
- PMW-3 (~9 feet South) – minimal pressure influence was observed at 13 and 11 feet bgs and measurable pressure influence was observed during injections at 17 feet bgs.

The estimated radius of influence from pressure readings on surrounding wells for IP-3 would be approximately 6 feet. Measurable pressure influence (3.4 psi at PMW-3) in the direction of the injection was observed as far as 10 feet away.

Well	Distance (ft from IP-3)	Injection Depth (ft bgs)					
		17	15	13	11	9	7
ML-3	2.25	X	X	X	X		X
ML-4	5.75			x	x	x	
PMW-2	6.25				x		
ML-5	8	x					
PMW-3	9	X		x	x		
ML-6	10	x	x	x	x	x	
PMW-5	12.25					x	
ML-1	13				x		
ML-7	13.75		x				
ML-2	16					X	x
X : Measurable pressure x : Some gas or odor							

4.2.4 IP-4

Pressure influence was visually observed or measured at the following locations during PF/PLI activities at IP-4:

- ML-2 (~10.25 feet Southwest) – minimal pressure influence was observed at all intervals and measurable pressure influence was observed during injection at 14.5 feet bgs; and
- PMW-2 (~6.25 feet Southeast) – measurable pressure influence was observed at 17.5, 11.5, 9.5 and 7.5 feet bgs.

The estimated radius of influence from pressure readings on surrounding wells for IP-4 would be approximately 8 feet. Measurable pressure influence (1.5 psi at PMW-5) in the direction of the injection was observed at 12.5 feet away.

Well	Distance (ft from IP-4)	Injection Depth (ft bgs)					
		17.5	15.5	13.5	11.5	9.5	7.5
ML-7	2.25		x				
ML-1	4.75			x			
ML-6	5			x	x		x
PMW-2	6.25	X		x	X	X	X
PMW-6	6.25		x				x
PMW-4	6.75		x				
ML-2	10.25	x	x	X	x	x	x
PMW-5	12.5	X		x			
ML-4	13	x				x	x
ML-3	14.75			X	x		x
PMW-3	16.75				x		x

Well	Distance (ft from IP-4)	Injection Depth (ft bgs)					
PMW-1	19.75				x	x	
X : Measurable pressure x : Some gas or odor							

4.2.5 IP-5

Pressure influence was visually observed or measured at the following locations during PF/PLI activities at IP-5:

- ML-2 (~7.75 feet Northeast) – minimal pressure influence was observed during injections in all directions at 18.5 feet bgs;
- ML-3 (~9 feet Northeast) – minimal pressure influence was observed during injections in all directions at 18.5 feet bgs;
- ML-4 (~8 feet Northeast) – minimal pressure influence was observed during injections in all directions at 18.5 feet bgs;
- ML-5 (~6.75 feet Northeast) – minimal pressure influence was observed during injections in all directions at 18.5 feet bgs;
- ML-6 (~6.75 feet Northeast) – minimal pressure influence was observed during injections in all directions at 18.5 feet bgs; and
- ML-7 (~9.25 feet Northeast) – minimal pressure influence was observed during all injections.

The estimated radius of influence from pressure readings on surrounding wells for IP-5 would be approximately 7 feet. Measurable pressure influence (1.4 psi at PMW-4) in the direction of the injection was observed at 11.75 feet away.

Well	Distance (ft from IP-5)	Injection Depth (ft bgs)						
		18.5	18.5	18.5	18.5	16.5	16.5	14.0
PMW-6	3.25				x			
PMW-5	4			x	x	x		x
ML-5	6.75	x	x	x	x	x		
ML-6	6.75	x	x	x	x			x
ML-2	7.75	x	x	x	x	x		x
ML-4	8	x	x	x	x	x		x
ML-3	9	X	x	x	x	x	x	
ML-7	9.25	x	x	x	x	x	x	x
PMW-3	10	x						
PMW-2	11.5	x	x					
PMW-4	11.75	X	x					
AMW-4	16.25							
PMW-1	18.25			x	x	x		
AMW-3	22.6		x					
X : Measurable pressure x : Some gas or odor								

4.2.6 IP-10

Pressure influence was visually observed or measured at the following locations during PF/PLI activities at IP-10:

- ML-2 (2.25 feet Northeast) – minimal pressure influence was observed during injections at all depths and measurable pressure influence was observed during injections at 15 ft bgs.

Although daylighting was seen at MW-6 (11 feet from IP-10) the estimated radius of influence from pressure readings on surrounding wells for IP-10 is likely less than 5 feet. Most influence was probably along the path of short-circuiting between IP-10 and MW-6. The only measurable pressure influence (2 psi at ML-2) in the direction of the injection was observed at 2.25 feet away.

Well	Distance (ft from IP-10)	Injection Depth (ft bgs)		
		18.0	16.0	15.0
ML-2	2.25	x	x	X
PMW-5	6			x
PMW-4	8.25		x	x
ML-7	11.75	x	x	x
ML-3	15.75	x	x	
PMW-3	15.75		x	
X : Measurable pressure x : Some gas or odor				

4.3 HEAVE MONITORING

Since the former structure at the SWMU-45 was already demolished, monitoring surface heave was not of a structural concern, but is still helpful in representing the influence of fracturing technology. The observed heave at the surface is representative of influence beneath the surface, which indicates both range and direction of the fracture. Readings logged during PF/PLI activities indicated maximum heave observed at IP-1, IP-2 and IP-3 of 0.3 inch; 0.4 inch at IP-4; 0.5 inch at IP-5; and 0.2 inch at IP-4 and IP-10. The results of heave monitoring are presented in Table 3. This table summarizes actual heave measured during PF/PLI activities and residual heave following PF/PLI.

Electronic heave monitoring, in the form of bi-axial tiltmeters, was also conducted during injection activities. Tiltmeter data is collected from eight locations and used to interpolate a map representing residual surface heave, relative to the injection point. According to data from the tiltmeters, residual heave at IP-2 was approximately 0.4 inch; overall heave at IP-1 and IP-3 was 0.2 inch; and at IP-4 heave of greater than 0.75 inch was indicated. No tiltmeter graphs exist for IP-5 and IP-10 for reasons discussed in Section 3.4.2. The results of electronic surface monitoring via tiltmeters are included in Appendix B.

5.0 CONCLUSIONS

Thirty-two directional fracture/injection events were completed at SWMU-45 between the depths of 7 and 18.5 feet bgs. Approximately 2,714 cubic feet of nitrogen was used to fracture and inject 508 gallons of EZVI into the targeted area. Based on the project proposal, 104,000 cubic feet of nitrogen was specified for the injection of 850 gallons over forty-eight fracture/injection events. Factors which led to the reduced nitrogen usage included the short fracturing duration, short injection duration, and reduction in injection volume, and reduction in the number of injections performed.

Since pressure in the monitoring wells was only contained during injections at IP-1 and IP-3, the pressure influence data is limited. At IP-1, pressure influence of 5 psi was noted at PMW-5, approximately 7 feet away. This pressure influence, and the presence of the well, ultimately resulted in the short-circuiting which compromised IP-1. Likewise, during injections at IP-3, pressure influence of 9 psi was observed at ML-3, approximately 3 feet away. During injections at IP-3, however, there was no appreciable influence seen at ML-4 or PMW-6, which were less than six feet away. The radius of influence observed at IP-3 and IP-1 were both limited by short-circuiting to nearby wells. In the absence of these channels for short-circuiting, the radius of influence would likely be in the range of 10 to 12 feet.

Tiltmeters can best be used as qualitative data to indicate a general trend of heave, rather than an exact measurement of it. The tiltmeter diagrams indicate at both IP-2 and IP-4 that a substantial depression occurred in the ground. This is due to the designation of the injection point as the reference for the diagram; all influence is relative to the injection point remaining stationary. For example, the diagram for IP-4 indicates subsidence to the east, but more likely it is the result of heave at the injection point. This is of some importance because the diagrams indicate a substantial compaction of the soil or negative heave, while the visual heave monitoring does not support such an effect.

Pressure influence at monitoring wells is the most accurate representation of radius of influence during injection and fracturing. Unfortunately, the presence of a well within the radius of

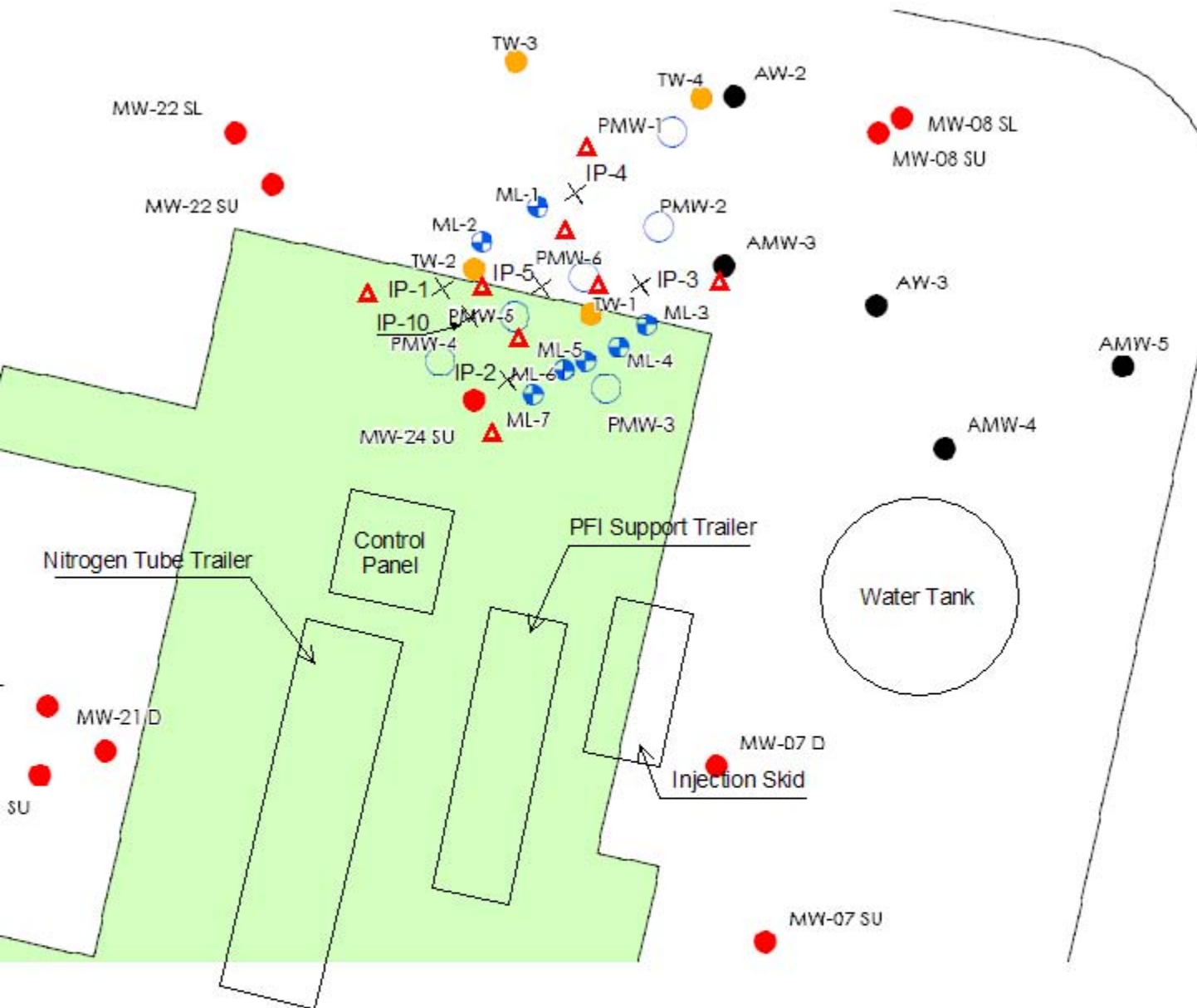
influence can lead to short-circuiting and daylighting, as observed at PMW-5 during injection at IP-1 and also at ML-3 during injection at IP-3. In these cases, the pre-existing monitoring well system actually limited the radius of influence and the ability to more uniformly distribute the EZVI. For application of the pneumatic fracturing to be practical, more spacious arrangement of wells would be necessary. Following injection activities, wells could be added to accurately define the injection distribution and also the effectiveness in contamination reduction.

With pneumatic injection, a few factors can be considered to minimize the complications encountered at SWMU-45. Pneumatic fracturing is more effective with a substantial overburden or with ground cover such as asphalt or concrete. Therefore, shallower injections in soft silty soil, like at Parris Island, are more prone to daylighting and smaller radius of influence. Also, with pneumatic injection, the likelihood of short-circuiting and the homogeneous condition of the soil are inversely related. At SWMU-45, the integrity of the soil had been compromised due to the number of wells in the vicinity, some as close as 3 feet to the injection point; thus, the potential for daylighting to the surface was greater. Also, the radius of influence which has been obtained with pneumatic fracturing and injection can be limited by the proximity to surrounding wells, utilities or other ground intrusions. The technology is most effective where the maximum radius can be attained with minimal short-circuiting and no daylighting (e.g., under structures, within more cohesive soils, with ground cover, or at deeper intervals. More importantly, PF/PLI is more effective in virgin soils or at distances greater than 15 feet from nearby monitoring wells.

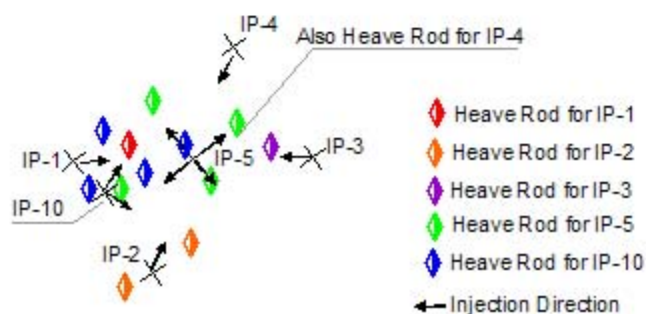
FIGURE 1

Site Map

Figure 1
SWMU-45 Site Layout

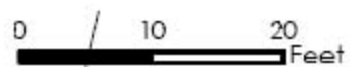


Injection Directions and Heave Rod Locations



LEGEND

- AM Well
- Monitoring Well
- Former Well
- New Monitoring Well
- ⊕ New Multilevel Well
- Demolished Building
- × Injection Point
- ▲ Tiltmeter Location



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TABLE 1

Pneumatic Fracturing/Injection Logs

TABLE 1
Pneumatic Injection Log
IP-1

Time	Inj No.	PI Depth (ft bgs)	Dir.	N2 Start P (psi)	N2 End P (psi)	No. of Tubes	Init. P (psi)	Actual P (psi)	Maint. P (psi)	Pump @ (min:sec)	Inj P (psi)	Pump P (psi)	Total Time (min:sec)	Inj. Time (min:sec)	Gals. Inj.	Action	Comments
1117	1	17.5	E	2200	2190	1	50	40	18	0:10	30	40	2:40	2:37	16	L	Note: 200psi to load tanks
1134	2	15.5	E	2190	2160	1	50	37	25	0:10	36	40	4:02	4:00	20-22	B&B/L	Gas from east side PMW-5 & bucket lift
1223	3	13.5	E	2160	2150	1	40	32		0:02	50	45	1:47	1:47	16	L	Pancake heave
1230	4	11.5	E	2150	2145	1	40	30		0:02	33	40	2:02	2:00	16	B&B/L	Daylighting, pillow 5' S from IP-1
				Abandon IP-1 @ last 2 intervals - will make up difference @ top 3 lifts in 2 directions @ IP-5													

PI : Pneumatic Injection
ft bgs : feet below ground surface
psi : pounds per square inch

Dir. : Direction
N2 : Nitrogen
P : Pressure

No. : Number
Init. : Initiation
Maint. : Maintenance

min:sec : minutes:seconds
Inj : Injection
gal : gallons
E : East

R : Rotate
B : Bleed and Break pipe
L : Lift to next interval
S : South

TABLE 1
Pneumatic Injection Log
IP-2

Time	Inj No.	PI Depth (ft bgs)	Dir.	N2 Start P (psi)	N2 End P (psi)	No. of Tubes	Init. P (psi)	Actual P (psi)	Maint. P (psi)	Pump @ (min:sec)	Inj P (psi)	Pump P (psi)	Total Time (sec)	Inj. Time (sec)	Gals. Inj.	Action	Comments
1403	1	17.5	N	2450	2440	1	42	35	32	5.09		60	57.62	55.65	16	L	PMW-3 evacuate H2O & gas
1411	2	15.5	N	2440	2430	1	40	30	26	3.5		60	51.12	50	16	B&B/L	Ground heave near PMW-5/off set next lift by 6"
1453	3	13	N	2430	2420	1	40	31	25	3.9		60	47	45.2	16	L	
1500	4	11	N	2420	2400	1	40	31	28	3.7		60	47	45.6	16	B&B/L	PMW-3 & 4 evacuate H2O
1547	5	9	N	2400	2385	1	40	32	26	4.6		60	42.5	40.2	16	L	PMW-3 evacuate H2O
1555	6	7	N	2385	2360	1	40	31	26	3.4		60	54.7	52.9	16	Remove	Heave @ PMW-5
1600		IP-2 complete															

PI : Pneumatic Injection

ft bgs : feet below ground surface

psi : pounds per square inch

Dir. : Direction

N2 : Nitrogen

P : Pressure

No. : Number

Init. : Initiation

Maint. : Maintenance

min:sec : minutes:seconds

Inj : Injection

gal : gallons

N : North

R : Rotate

B : Bleed and Break pipe

L : Lift to next interval

H2O : Water

TABLE 1
Pneumatic Injection Log
IP-3

Time	Inj No.	PI Depth (ft bgs)	Dir.	N2 Start P (psi)	N2 End P (psi)	No. of Tubes	Init. P (psi)	Actual P (psi)	Maint. P (psi)	Pump @ (min:sec)	Inj P (psi)	Pump P (psi)	Total Time (min:sec)	Inj. Time (min:sec)	Gals. Inj.	Action	Comments
1525	1	17	W	2120		1	40										No frac- dialed to 55-clogged
																	Dialed down PRV's on MW to 0 & left MLs @ ~ 15psi to minimize clogging. For 1st 3 shots PMW-5 evacuate H2O
1539	1	17	W	2120	2095	1	40	34	28	0:05		40/50/40	1:44	1:42	16	L	
1546	2	15	W	2095	2060	1	35	26	22	0:05		40/45/40	1:22	1:20	16	B&B/L	EZVI blew out E side ML-3 well pad/load EZVI
1635	3	13	W	2055	2045	1	40	34	36	00:04.7		60	0:55	0:54	16	L	Daylight/bubbling during init. PF shot & 2 sec. Past PF post-lifted drum(vent) located E of IP-3
1649	4	11	W	2045	2000	1	40	34	31	0:03		60	0:54	0:52	16	B&B/L	
1736	5	9	W	2000	1990	1	40	32	26	00:02.5		60	0:35	0:34	16	L	Lifted drum & same ML-3 observation
1745	6	7	W	1990	1985	1	40	31	28	00:02.7		60	0:45	0:42	16	L&Pull	
																	levellogger from PMW-5 had EZVI on it

PI : Pneumatic Injection
ft bgs : feet below ground surface
psi : pounds per square inch

Dir. : Direction
N2 : Nitrogen
P : Pressure

No. : Number
Init. : Initiation
Maint. : Maintenance
W : West

min:sec : minutes:seconds
Inj : Injection
gal : gallons
E : East

R : Rotate
B : Bleed and Break pipe
L : Lift to next interval
PRV : Pressure Relief Valve

TABLE 1
Pneumatic Injection Log
IP-4

Time	Inj No.	PI Depth (ft bgs)	Dir.	N2 Start P (psi)	N2 End P (psi)	No. of Tubes	Init. P (psi)	Actual P (psi)	Maint. P (psi)	Pump @ (min:sec)	Inj P (psi)	Pump P (psi)	Total Time (min:sec)	Inj. Time (min:sec)	Gals. Inj.	Action	Comments
1014	1	17.5	S	2500	2490	1	45	38		0:05		50	0:51	0:49	10	L	PMW-6 gas, evacuate edge W side
1028	2	15.5	S	2490	2485	1	40	32		00:04.9		50	0:37	0:35	10	B&B/L	PMW-6 evacuate gas
1104	3	13.5	S	2485	2480	1	40	29		00:05.3		50	0:36	0:34	10	L	PMW-6 evacuate gas
1112	4	11.5	S	2480	2475	1	40	28		00:05.3		50	0:44	0:42	10	B&B/L	PMW-6 evacuate gas & water
1154	5	9.5	S	2475	2470	1	40	34		00:04.9		50	00:34.8	0:33	10	L	PMW-6 evacuate gas & water
1203	6	7.5	S	2470	2465	1	40	30		0:03		50	0:34	00:32.2	10	R 180	PMW-6 evacuate gas & water
1210		IP-4 complete															

PI : Pneumatic Injection
ft bgs : feet below ground surface
psi : pounds per square inch

Dir. : Direction
N2 : Nitrogen
P : Pressure

No. : Number
Init. : Initiation
Maint. : Maintenance

min:sec : minutes:seconds
Inj : Injection
gal : gallons
W : West

R : Rotate
B : Bleed and Break pipe
L : Lift to next interval
S : South

TABLE 1
Pneumatic Injection Log
IP-5

Time	Inj No.	PI Depth (ft bgs)	Dir.	N2 Start P (psi)	N2 End P (psi)	No. of Tubes	Init. P (psi)	Actual P (psi)	Maint. P (psi)	Pump @ (min:sec)	Inj P (psi)	Pump P (psi)	Total Time (min:sec)	Inj. Time (min:sec)	Gals. Inj.	Action	Comments
940	1	18.5	NW	2300		1	45-90						1:30				
944		18.5	NW	2300	2260	1	75	66		5.5	60	60	01:10.3	01:02.6	16	R	PMW-6 & 3 evacuate water; delayed PF
952	2	18.5	NE	2260	2255	1	55	41		4.9	50	60	01:02.2	00:59.7	16	R	
1001	3	18.5	SE	2255	2250	1	55	38		4.9	61	60	01:03.8	00:59.8	16	R	Slug of EZVI from PMW-6
1009	4	18.5	SW	2250	2245	1	50	35		4.93	57	60	01:01.5	58.12	16	L	PMW-6 & 3 evacuate water; heave & gas evacuate from ground ~3'
1023	5	16.5	SW	2245	2235	1	40	28		3.5		60	0:49	47.03	16	R	Ground heave near PMW-6
1033	6	16.5	NW	2235	2225	1	40	30		3.5		60	00:43.0	40.75	16	R	Ground heave near PMW-6 & ML-3 & daylight 1-2 gal.
1159	7	14	NW	2225		1	25-75		no PF	2:20							
							50-100		no PF	1:20							Checked nozzle clogged
1232	7	14	NW	2225	2190	1	25	19		1:21				1:44	9		Daylight same spot- 5 gal @ surface

PI : Pneumatic Injection
ft bgs : feet below ground surface
psi : pounds per square inch

Dir. : Direction
N2 : Nitrogen
P : Pressure
SE : Southeast

No. : Number
Init. : Initiation
Maint. : Maintenance
SW : Southwest

min:sec : minutes:seconds
Inj : Injection
gal : gallons
NE : Northeast

R : Rotate
B : Bleed and Break pipe
L : Lift to next interval
NW : Northwest

TABLE 1
Pneumatic Injection Log
IP-10

Time	Inj No.	PI Depth (ft bgs)	Dir.	N2 Start P (psi)	N2 End P (psi)	No. of Tubes	Init. P (psi)	Actual P (psi)	Maint. P (psi)	Pump @ (min:sec)	Inj P (psi)	Pump Inj. P (psi)	Total Time	Inj. Time	Gals. Inj.	Action	Comments
1542	1	18	NNE	2080		1	25-85		18	1:32							
1546		18	NNE			1	50		25	00:44.7							
1548		18	NNE	2060		1	60										Daylight same spot
1550		18	NNE	2060	2050	1	82	79		00:36.5		40-30	3:40	3:20	27	L	
1612	2	16	NNE	2050	2035	1	25	19		00:01.4		40-35	1:57	01:56.0	27	L	Lost DataQ file / Daylight during injection & post-PF
1629	3	15	NNE	2035	2000	1	20			00:01.1		40	2:37	2:34	27		Continue daylighting same spot
			~ 30 gallons out after injecting ~ 81 gallons in. Abandon point - 280 gallons left to inject. Vironex try DP.														

PI : Pneumatic Injection
ft bgs : feet below ground surface
psi : pounds per square inch

Dir. : Direction
N2 : Nitrogen
P : Pressure

No. : Number
Init. : Initiation
Maint. : Maintenance

min:sec : minutes:seconds
Inj : Injection
gal : gallons

R : Rotate
B : Bleed and Break pipe
L : Lift to next interval
NNE : North Northeast

TABLE 2

Pressure Monitoring Logs/ Observations

TABLE 2
Pressure Monitoring Log
IP-1

Date	Time	Fracture No.	Well	Pressure Influence (psi)	Observations
10.14.06	1125	1	MW24SU	1	
			PMW5	2.8	
			ML2	5	no increase, same reading
	1140	2	PMW5	4.4	
			ML2	5	
	1230	3			no readings, gauges not zeroed
	1240	4	PMW5	1.4	
			ML2	5	

No. : Number

psi : pounds per square inch

TABLE 2
Pressure Monitoring Log
IP-2

Date	Time	Fracture No.	Well	Pressure Influence (psi)	Observations
10.16.06	1400	1	MW24SU		gas, no measurable reading
			PMW4		gas, no measurable reading
			ML2		gas, no measurable reading
			AMW3		gas, no measurable reading
			PMW2		gas, no measurable reading
			ML7		gas, no measurable reading
			ML4		gas, no measurable reading
			ML3		gas, no measurable reading
	1415	2	MW24SU		gas, no measurable reading
			MW7	3	gas, gurgling, water
			ML2	2	
			ML3		gas, no measurable reading
			ML4		gas, no measurable reading
			PMW3		gas, water, no measurable reading
	1500	3	ML7		gas, little gurgle, no measurable reading
			ML6		gas, no measurable reading
			ML5		gas, no measurable reading
			PMW3		gas, no measurable reading
			ML4		gas, no measurable reading
			ML2		gas, no measurable reading
	1505	4	PMW4		gas, no measurable reading
			ML7		gas, no measurable reading
			ML6		gas, water, no measurable reading
			ML5		gas, no measurable reading
			ML4		gas, no measurable reading
			ML3		gas, no measurable reading
	1550	5	PMW4		gas, no measurable reading
			PMW5		gas, no measurable reading
			ML4		gas, no measurable reading
			ML5		gas, no measurable reading
			ML6		gas, water, no measurable reading
			ML7	1.4	
	1600	6	ML2		gas, no measurable reading
			PMW6		gas, no measurable reading
			ML4		gas, no measurable reading
			ML5		gas, no measurable reading
			ML7		gas, no measurable reading

No. : Number

psi : pounds per square inch

TABLE 2
Pressure Monitoring Log
IP-3

Date	Time	Fracture No.	Well	Pressure Influence (psi)	Observations
10.14.06	1530	1	PMW3	3.4	water evacuated into drum
			ML3	9.2	
			ML5		pressure, no measurable reading
			ML6		pressure, no measurable reading
	1550	2	ML7		pressure, no measurable reading
			ML6		pressure & water, no measurable reading
			ML3	6.5	significant daylighting of EZVI adjacent to this well
	1645	3	ML6		pressure & water, no measurable reading
			ML4		pressure, no measurable reading
			PMW3		pressure, no measurable reading
			ML3	6	
	1655	4	ML1		pressure, no measurable reading
			ML3	3.5	
			PMW2		pressure, no measurable reading
			ML4		pressure, no measurable reading
			ML6		pressure, no measurable reading
			PMW3		pressure, no measurable reading
	1745	5	ML2	2	holding 0.5 lbs.
			ML4		pressure, no measurable reading
			ML3		pressure, no measurable reading
			PMW5		pressure, no measurable reading
			ML7		pressure, no measurable reading
	1755	6	ML3	1.5	
			ML2		pressure, no measurable reading

No. : Number

psi : pounds per square inch

TABLE 2
Pressure Monitoring Log
IP-4

Date	Time	Fracture No.	Well	Pressure Influence (psi)	Observations
10.16.06	1020	1	ML4		gas, no measurable reading
			PMW2	2	
			ML2		gas, no measurable reading
			PMW5	1.5	
	1030	2	ML7		gas, no measurable reading
			PMW4		gas, no measurable reading
			ML2		gas, no measurable reading
			PMW6		gas, no measurable reading
	1110	3	PMW5		gas, no measurable reading
			ML2	1.5	
			ML6		water, gas, no measurable reading
			ML1		gas, no measurable reading
			PMW2		a lot of gas(more than usual), no reading
			ML3	0.6	a little gas
	1120	4	PMW2	5	gas also
			PMW1		gas, no measurable reading
			ML3	0.04	gas
			ML6		gas & water, no measurable reading
			PMW3		gas & water, no measurable reading
			ML2		gas & water, no measurable reading
	1200	5	ML2		gas & water, no measurable reading
			PMW2	5	gas, residual pressure
			PMW1		gas
			ML4		gas, no measurable reading
			ML6		gas & water, no measurable reading
	1210	6	ML2		gas, no measurable reading
			ML6		gas, no measurable reading
			ML4		gas, no measurable reading
			ML3		gas, no measurable reading
			PMW2	1	gas

No. : Number

psi : pounds per square inch

TABLE 2
Pressure Monitoring Log
IP-5

Date	Time	Fracture No.	Well	Pressure Influence (psi)	Observations
10.17.06	940	1	PMW4	1.4	gas
			ML2		gas, no measurable reading
			PMW2		gas, no measurable reading
			ML3	1.5	gas
			ML4		gas, no measurable reading
			PMW3		gas, no measurable reading
			ML5		gas, no measurable reading
			ML6		gas, no measurable reading
			ML7		gas, & odor, no measurable reading
	955	2	ML7		gas & water, w/ residual of both, no reading
			PMW4		gas, no measurable reading
			ML2		gas, no measurable reading
			PMW2		gas, no measurable reading
	955	2	AMW3		gas, no measurable reading
			ML3		gas, no measurable reading
			ML4		gas, no measurable reading
			ML5		gas, no measurable reading
			ML6		continuous gas & water
	1005	3	ML2		gas, odor
			PMW5		gas, water
			ML7		gas
			ML6		gas
			ML5		gas
			ML4		gas
			ML3		gas
			PMW1		gas
	1015	4	PMW5		gas
			ML7		continuous gas & water
			ML6		gas
			ML5		gas
			ML4		gas
			ML3		gas
			PMW6		gas
			PMW1		gas
			ML2		gas
	1025	5	ML2		gas
			PMW5		gas
			ML7		gas & water
			ML5		gas
			ML4		gas
			ML3		gas

TABLE 2
Pressure Monitoring Log
IP-5

Date	Time	Fracture No.	Well	Pressure Influence (psi)	Observations
	1025	5	PMW1		gas
	1035	6	ML7		gas & water & odor
			ML3		gas, major daylighting & mounding between this well & PMW6
	1205	7	ML7		gas w/residual
			PMW5		gas
			ML2		gas
			ML4		gas
			ML6		gas

No. : Number

psi : pounds per square inch

TABLE 2
Pressure Monitoring Log
IP-10

Date	Time	Fracture No.	Well	Pressure Influence (psi)	Observations
10.17.06	1550	1	ML2		gas
			ML3		gas
			ML7		gas
	1619	2	PMW4		gas
			ML2		gas
			ML3		gas
			PMW3		gas
			ML7		gas
	1634	3	PMW4		gas
			PMW5		gas
			ML7		gas
			ML2	2	no gas

No. : Number

psi : pounds per square inch

TABLE 3

Surface Heave Measurement Logs

TABLE 3
Surface Heave Measurement Log
IP-1

Date	Location	Inj No.	Initial Measurement	Fracture Measurement	Maximum Heave (in)	Final Measurement	Residual Heave (in)	Comments
10.14.06	Heave Rod	1	16-11/16"	16-7/16"	1/4"	16-10/16"	1/16"	Heave rod is 1.5' below grade / 4' ENE from IP-1
		2	16-10/16"	16-5/16"	5/16"	16-9/16"	1/16"	
		3	16-11/16"	16-9/16"	1/8"	16-5/8"	1/16"	
		4	16-5/8"	16-1/2"	1/8"	16-11/16"	0	Daylighting EZVI, switching points

Inj : Injection

in : inch

No. : Number

ENE : East Northeast

Reference Location : Utility shed 61' 2.5" from transit: 8 11/16"

TABLE 3
Surface Heave Measurement Log
IP-2

Date	Location	Inj No.	Initial Measurement	Fracture Measurement	Maximum Heave (in)	Final Measurement	Residual Heave (in)	Comments
10.16.06	S	1	16-3/16"	same	0	same	0	
	NE		51-5/16"	51-1/4"	1/16"	51-5/16"	0	
	S	2	16-3/16"	same	0	same	0	
	NE		51-5/16"	51-1/16"	1/4"	51-1/4"	1/16"	
	S	3	16-3/16"	same	0	same	0	
	NE		51-5/16"	51-3/16"	1/8"	51-5/16"	0	
	S	4	16-3/16"	16-1/8"	1/16"	16-3/16"	0	
	NE		51-5/16"	51-3/16"	1/8"	51-1/4"	1/16"	
	S	5	16-3/16"	same	0	same	0	
	NE		51-5/16"	50-15/16"	3/8"	51-3/16"	1/8"	
	S	6	16-3/16"	same	0	same	0	
	NE		51-3/16"	50-15/16"	1/4"	51"	3/16"	

Inj : Injection
No. : Number

in : inch
NE : Northeast

S : South

Reference Location : Utility shed 61' 2.5" from transit: 8 11/16"

TABLE 3
Surface Heave Measurement Log
IP-3

Date	Location	Inj No.	Initial Measurement	Fracture Measurement	Maximum Heave (in)	Final Measurement	Residual Heave (in)	Comments
10.14.06	Heave Rod	1	50-3/8"	50-1/16"	5/16"	50-5/16"	1/16"	Heave rod is 1.5' below grade / 4' ENE from IP-1
		2	50-5/16"	50-1/4"	1/16"	50-3/8"	0 - subsidence to initial reading @ 1st frac	Significant daylighting 3' S of IP
		3	50-3/8"	50"	3/8"	50-5/16"	1/16"	
		4	50-5/16"	50-1/16"	1/4"	50-5/16"	0	at 1730, Tiltmeter #1 was bumped, I630 according to computer's clock
		5	50-5/16"	50-1/4"	1/16"	50-5/16"	0	
		6	50-5/16"	50-3/16"	1/8"	50-5/16"	0	

Inj : Injection
No. : Number

in : inch
ENE : East Northeast

S : South

Reference Location : Utility shed 61' 2.5" from transit: 8 11/16"

TABLE 3
Surface Heave Measurement Log
IP-4

Date	Location	Inj No.	Initial Measurement	Fracture Measurement	Maximum Heave (in)	Final Measurement	Residual Heave (in)	Comments
10.16.06	S	1	16-3/4"	16-1/2"	1/4"	16-11/16"	1/16"	
	E		52-7/16"	same	0	same	0	
	S	2	16-3/4"	16-9/16"	3/16"	16-3/4"	0	
	E		52-7/16"	same	0	same	0	
	S	3	16-3/4"	16-11/16"	1/16"	16-3/4"	0	
	E		52-7/16"	same	0	same	0	
	S	4	16-3/4"	16-5/8"	1/8"	16-3/4"	0	
	E		52-7/16"	same	0	same	0	
	S	5	16-13/16"	16-11/16"	1/8"	16-13/16"	0	1/16" subsidence from initial reading
	E		52-7/16"	same	0	same	0	
	S	6	16-13/16"	16-3/4"	1/16"	16-13/16"	0	
	E		52-7/16"	same	0	same	0	

Inj : Injection
No. : Number

in : inch
E : East

S : South

Reference Location : Utility shed 61' 2.5" from transit: 8 11/16"

TABLE 3
Surface Heave Measurement Log
IP-5

Date	Location	Inj No.	Initial Measurement	Fracture Measurement	Maximum Heave (in)	Final Measurement	Residual Heave (in)	Comments
10.17.06	NW	1	17-1/8"	same	0	same	0	
	NE		17-3/16"	same	0	same	0	
	SE		53"	same	0	same	0	
	SW		28-1/2"	same	0	same	0	
	NW	2	17-1/8"	same	0	same	0	
	NE		17-3/16"	17-1/8"	1/16"	17-3/16"	0	
	SE		53"	same	0	same	0	
	SW		28-1/2"	same	0	same	0	
	NW	3	17-1/8"	same	0	same	0	
	NE		17-3/16"	same	0	same	0	
	SE		53-1/16"	52-9/16"	1/2"	53"	0	1/16" subsidence before heave
	SW		28-1/2"	same	0	same	0	
	NW	4	17-1/8"	same	0	same	0	
	NE		17-3/16"	same	0	same	0	
	SE		53"0	same	0	same	0	
	SW		28-1/2"	28-7/16"	1/16"	same	0	
	NW	5	17-1/8"	17-1/16"	1/16"	17-1/8"	0	
	NE		17-3/16"	same	0	same	0	
	SE		53"	52-1/2"	1/2"	52-11/16"	5/16"	
	SW		28-1/2"	same	0	same	0	
	NW	6	17-1/8"	17-13/16"	subsidence 1/16"	17-3/16"	subsidence	Major mounding & EZVI daylighting
	NE		17-3/16"	same	0	same	0	in opposite direction of injection
	SE		52-11/16"	52-7/16"	1/4"	52-11/16"	0	between 2 monitoring wells -
	SW		28-1/2"	same	0	same	0	PMW-6 & ML-3
	NW	7	17-13/16"	same	0	same	0	subsidence from earlier initial
	NE		17-5/16"	same	0	same	0	subsidence from earlier initial
	SE		52-7/8"	52-3/4"	1/8"	52-13/16"	1/16"	3/16" residual heave from earlier
	SW		28-9/16"	same	0	same	0	subsidence from earlier initial
								abandon hole

Inj : Injection
No. : Number

in : inch
NE : Northeast

SE : Southeast
NW : Northwest

SW : Southwest

Reference Location : Steamline Pole Support West of Transit: 5 1/16"

TABLE 3
Surface Heave Measurement Log
IP-10

Date	Location	Inj No.	Initial Measurement	Fracture Measurement	Maximum Heave (in)	Final Measurement	Residual Heave (in)	Comments
10.17.06	NW	1	17-7/16"	same	0	same	0	formation would not break, tried small pressure increments, when it finally let go, N2 caused daylighting around monitoring well PMW-6
	SW		16"	same	0	same	0	
	E		52-15/16"	52-3/4"	3/16"	52-15/16"	0	
	SE		31-1/4"	same	0	same	0	
	NW	2	17-7/16"	same	0	same	0	
	SW		16"	same	0	same	0	
	E		52-15/16"	same	0	same	0	
	SE		31-1/4"	31-3/16"	1/16"	31-3/16"	1/16"	
	NW	3	17-7/16"	same	0	same	0	
	SW		16"	same	0	same	0	
	E		52-15/16"	52-7/8"	1/16"	52-13/16"	1/8"	
	SE		31-3/16"	same	0	same	0	

Inj : Injection
No. : Number

in : inch
E : East

SE : Southeast
NW : Northwest

SW : Southwest

Reference Location : Steamline Pole Support West of Transit: 5 1/16"

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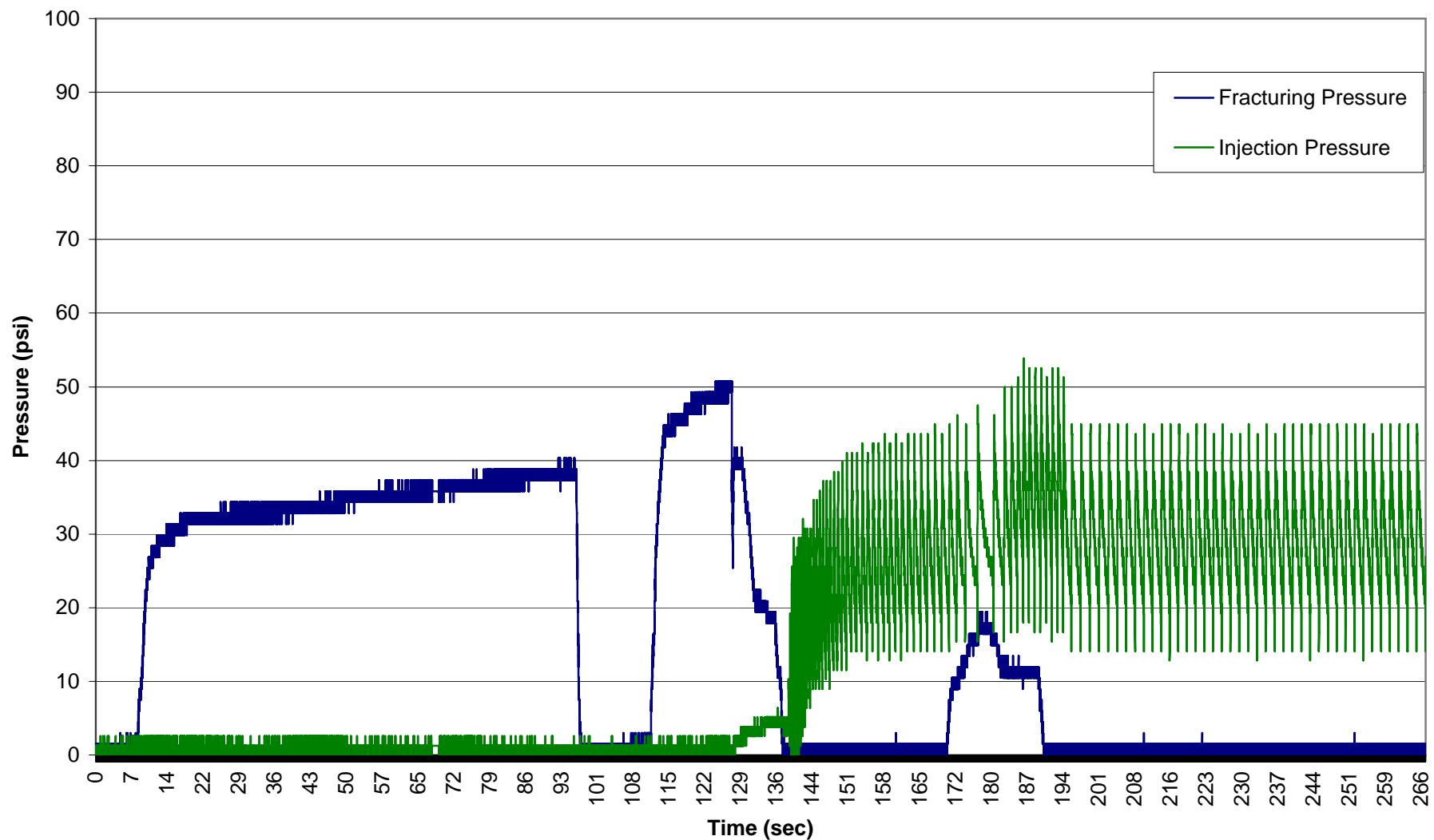
APPENDIX A

Pressure-Time History Curves

IP-1

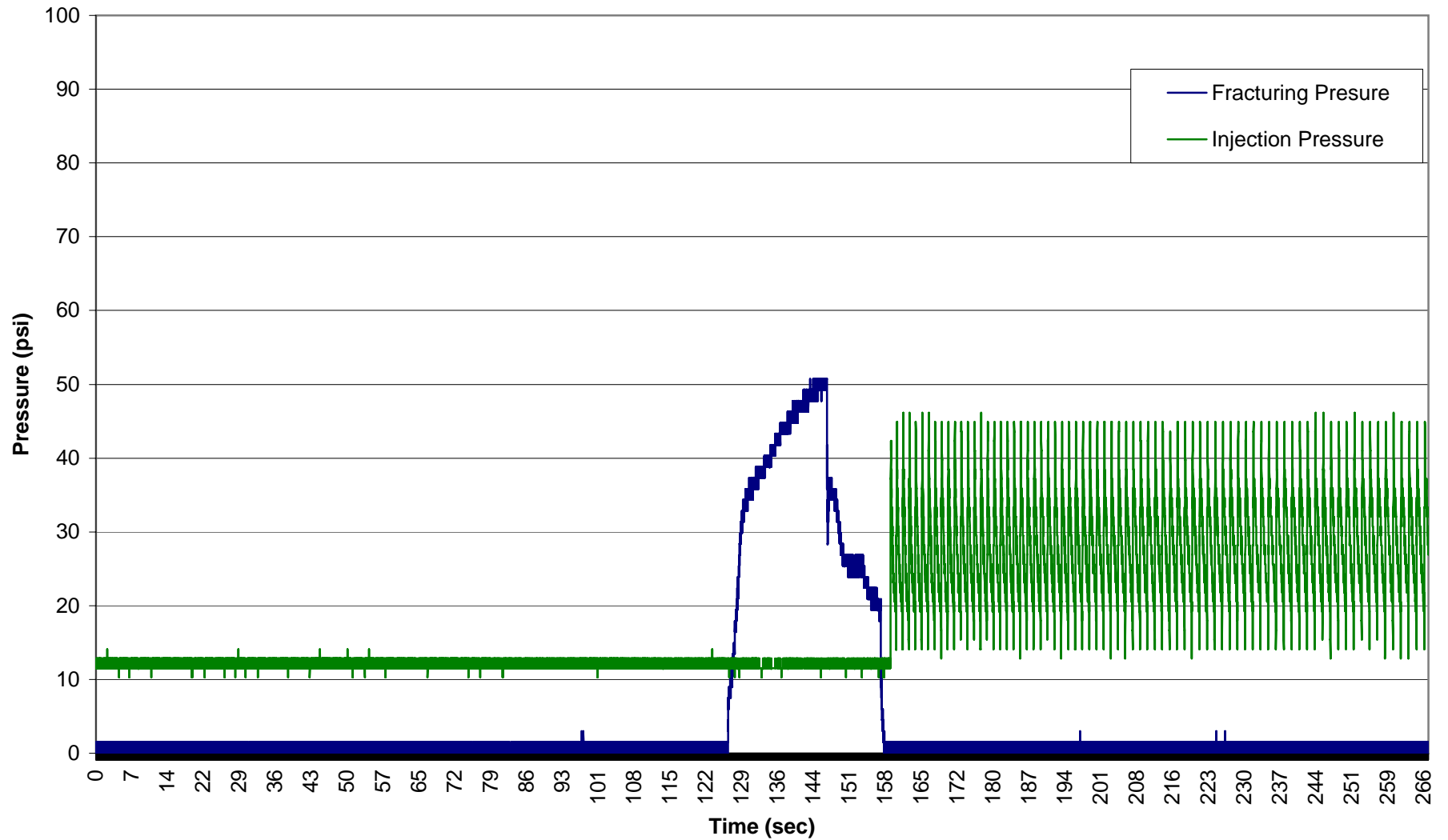
Pressure Time History Curve IP-1

17.5 ft bgs, East



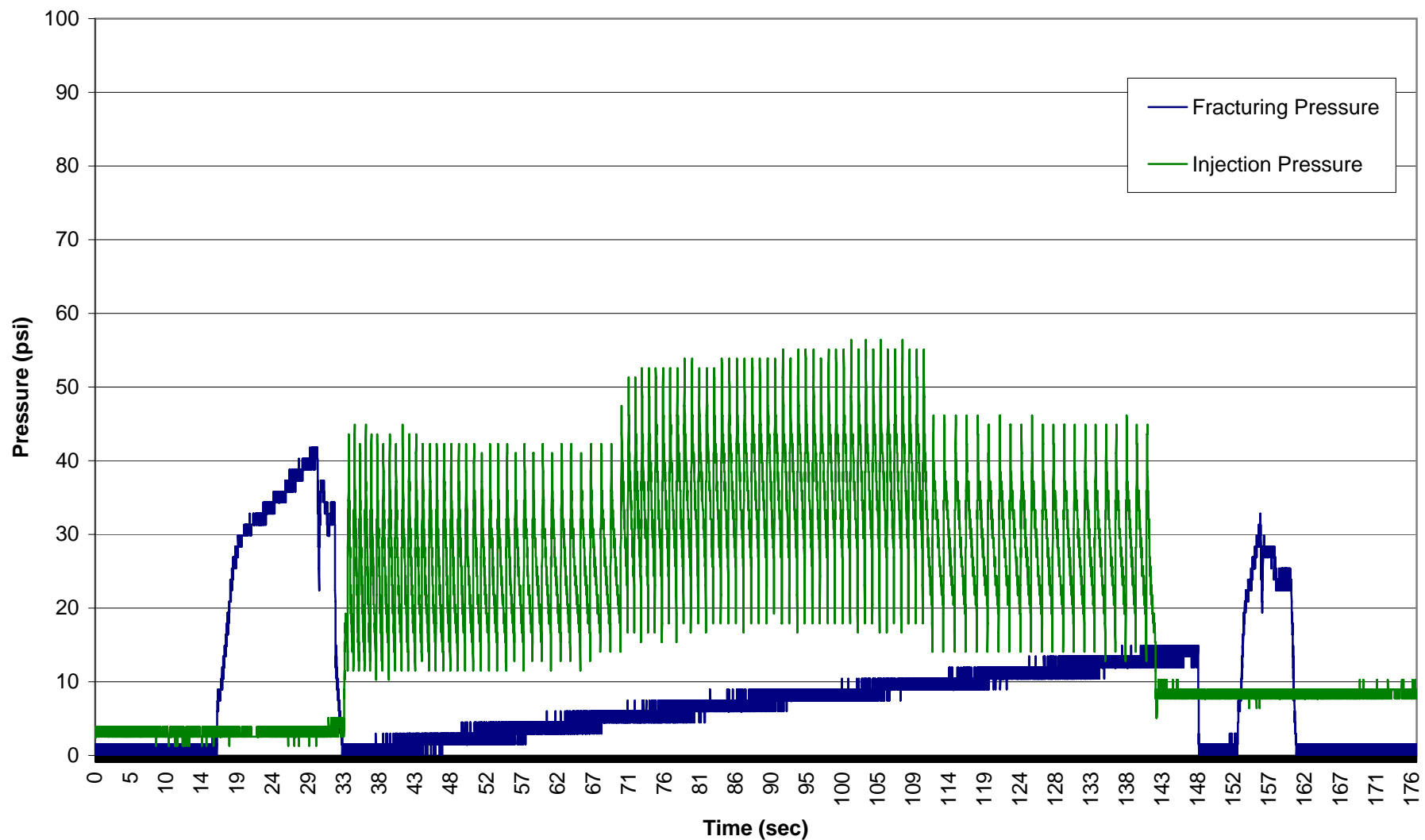
Pressure Time History Curve IP-1

15.5 ft bgs, East



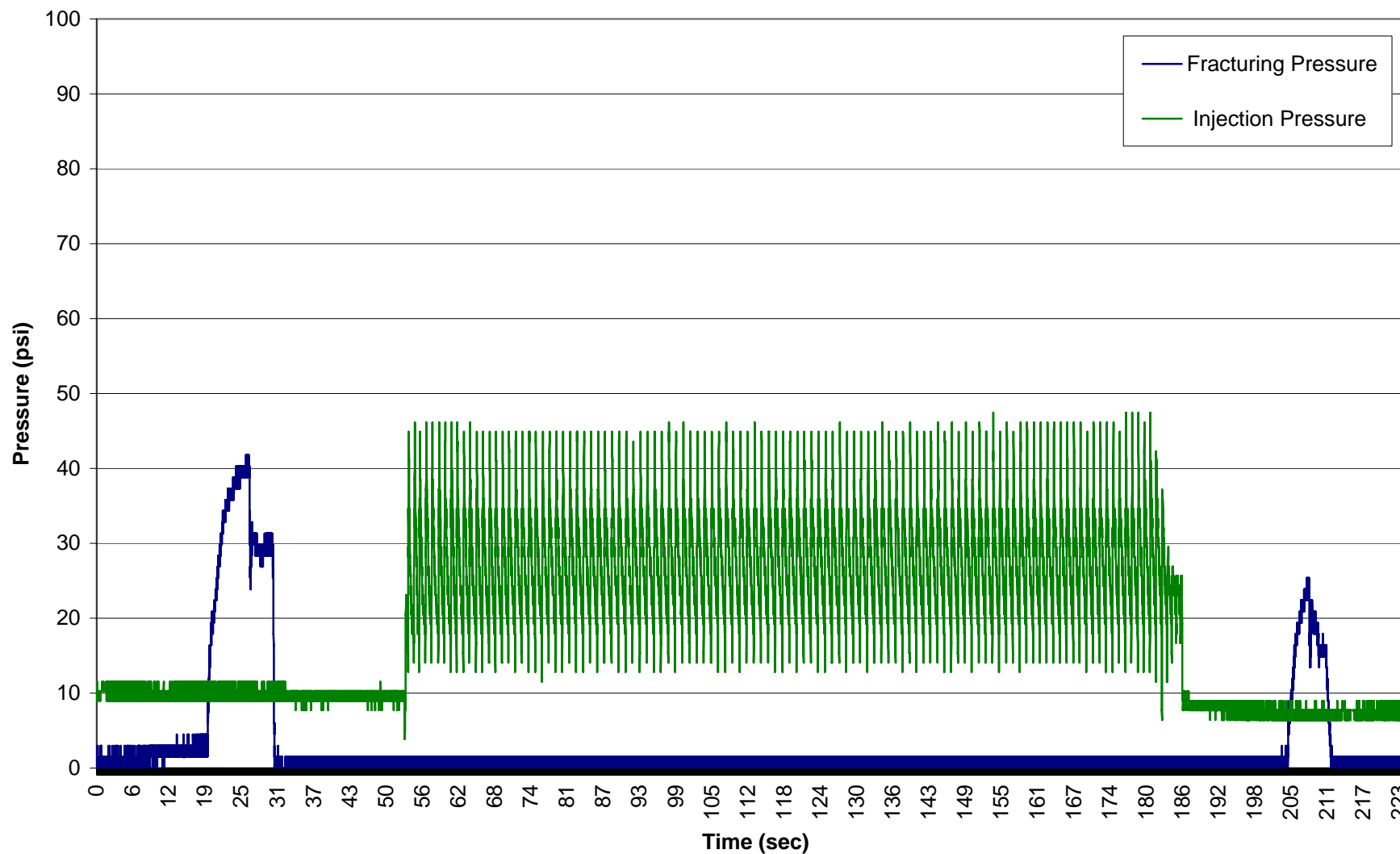
Pressure Time History Curve IP-1

13.5 ft bgs, East



Pressure-Time History Curve IP-1

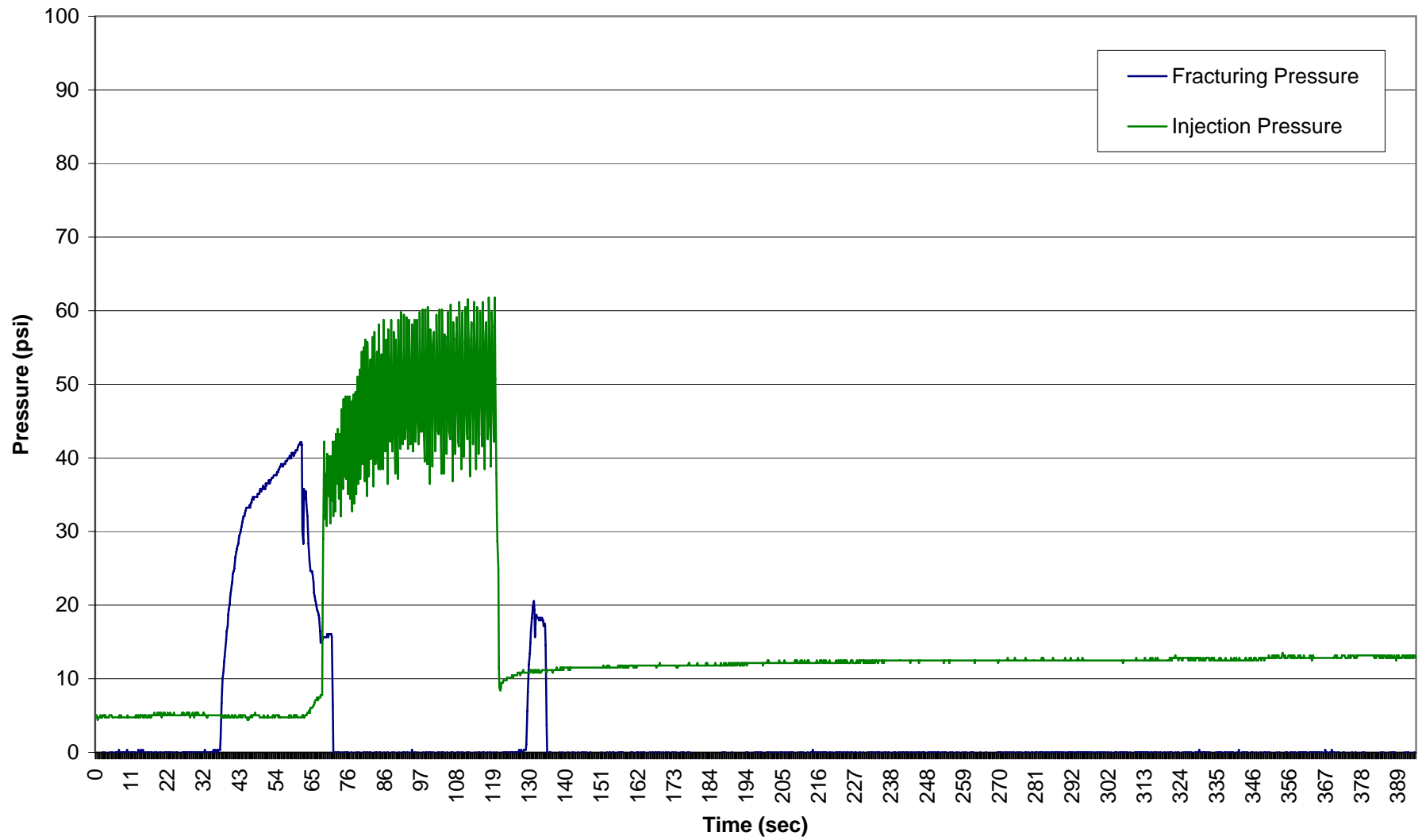
11.5 ft bgs, East



IP-2

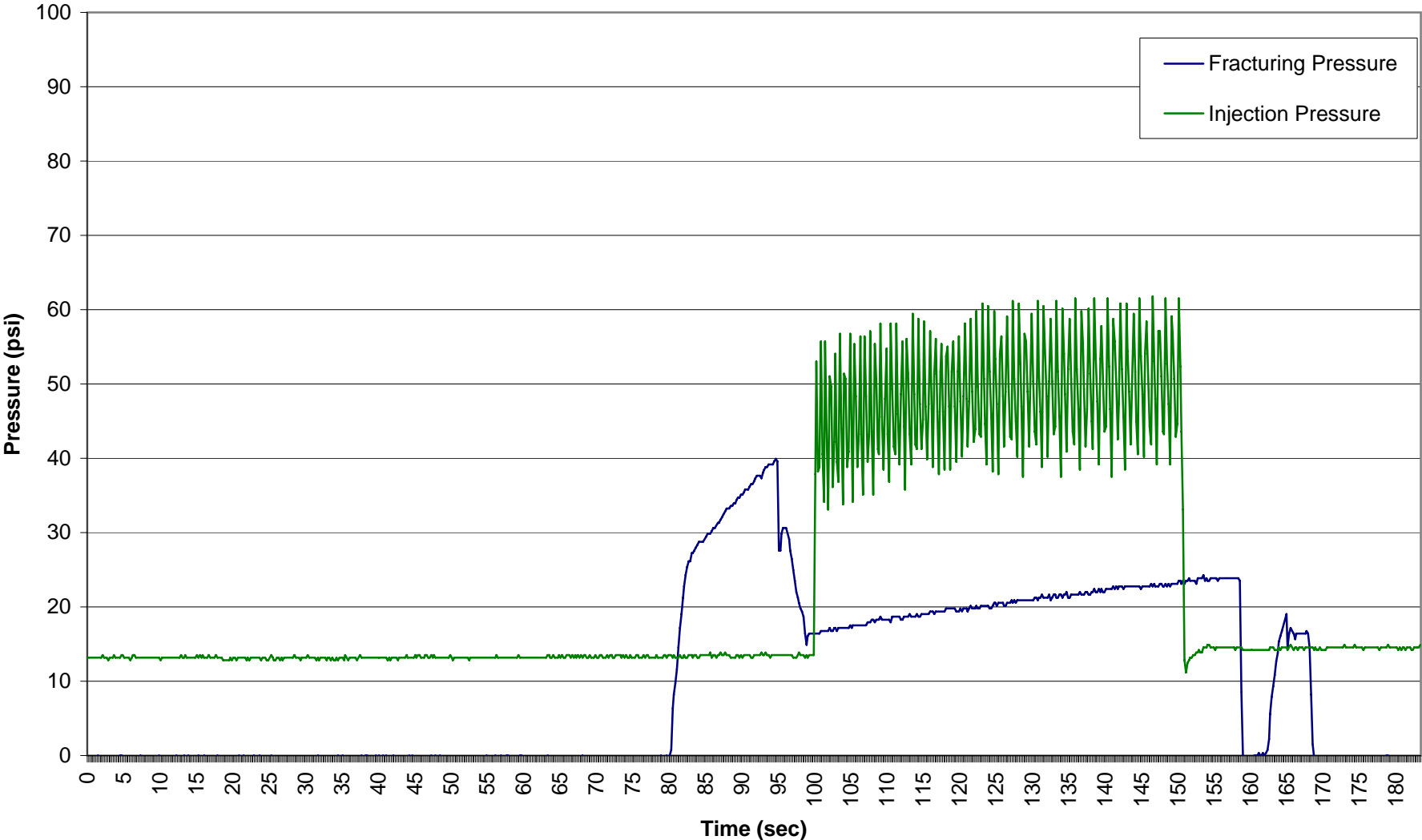
Pressure Time History Curve
IP-2

17.5 ft bgs, North



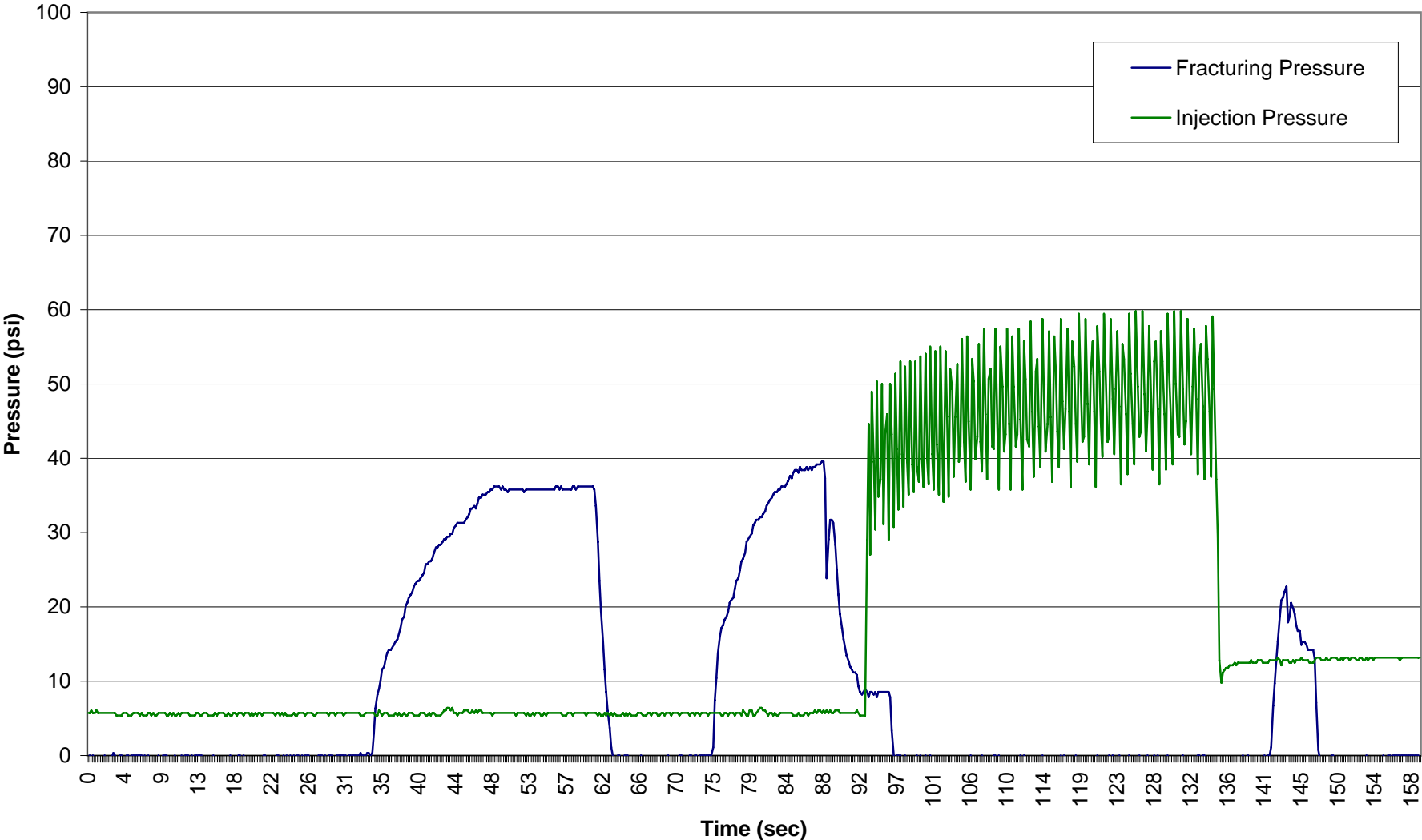
Pressure Time History Curve
IP-2

15.5 ft bgs, North



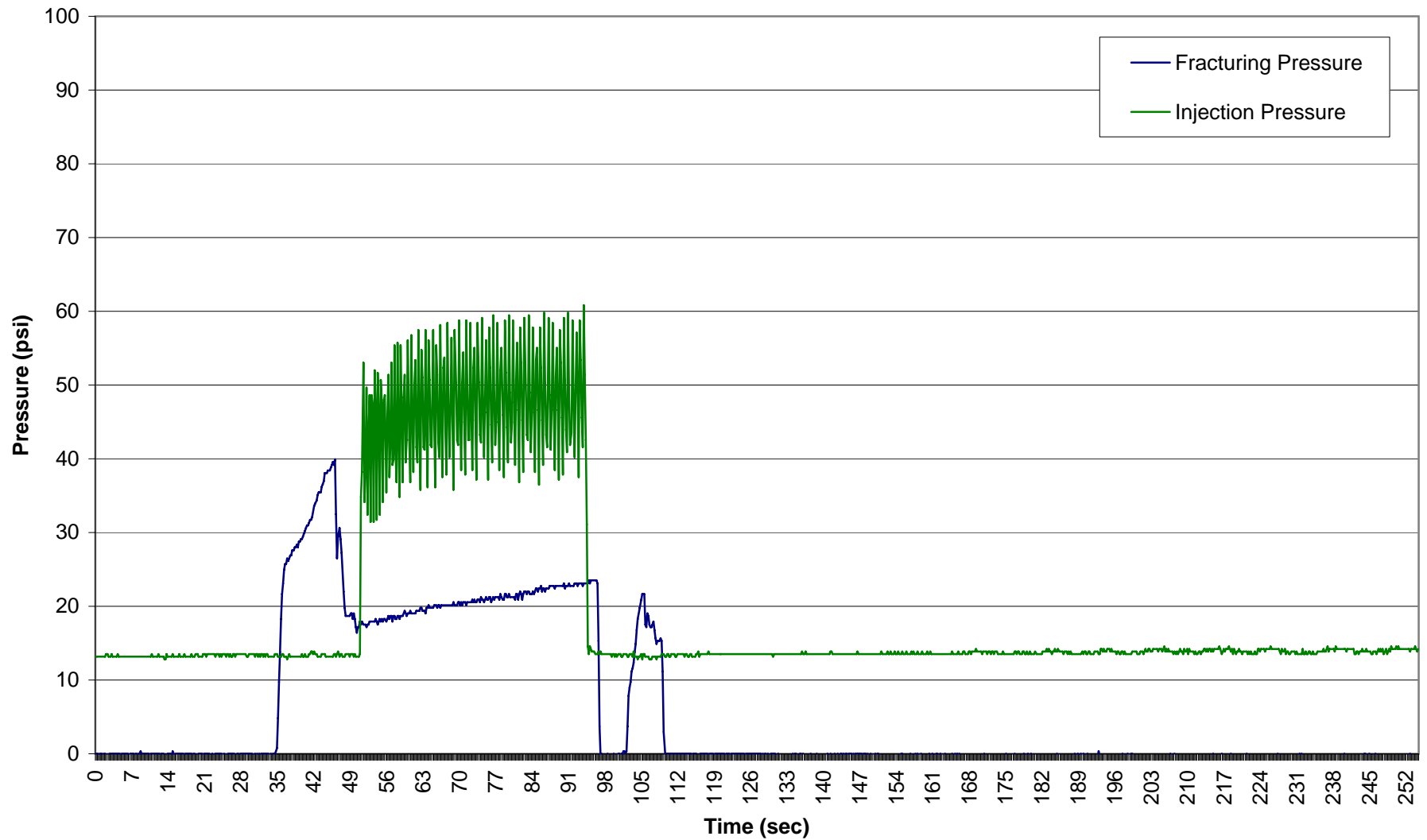
Pressure Time History Curve
IP-2

13 ft bgs, North



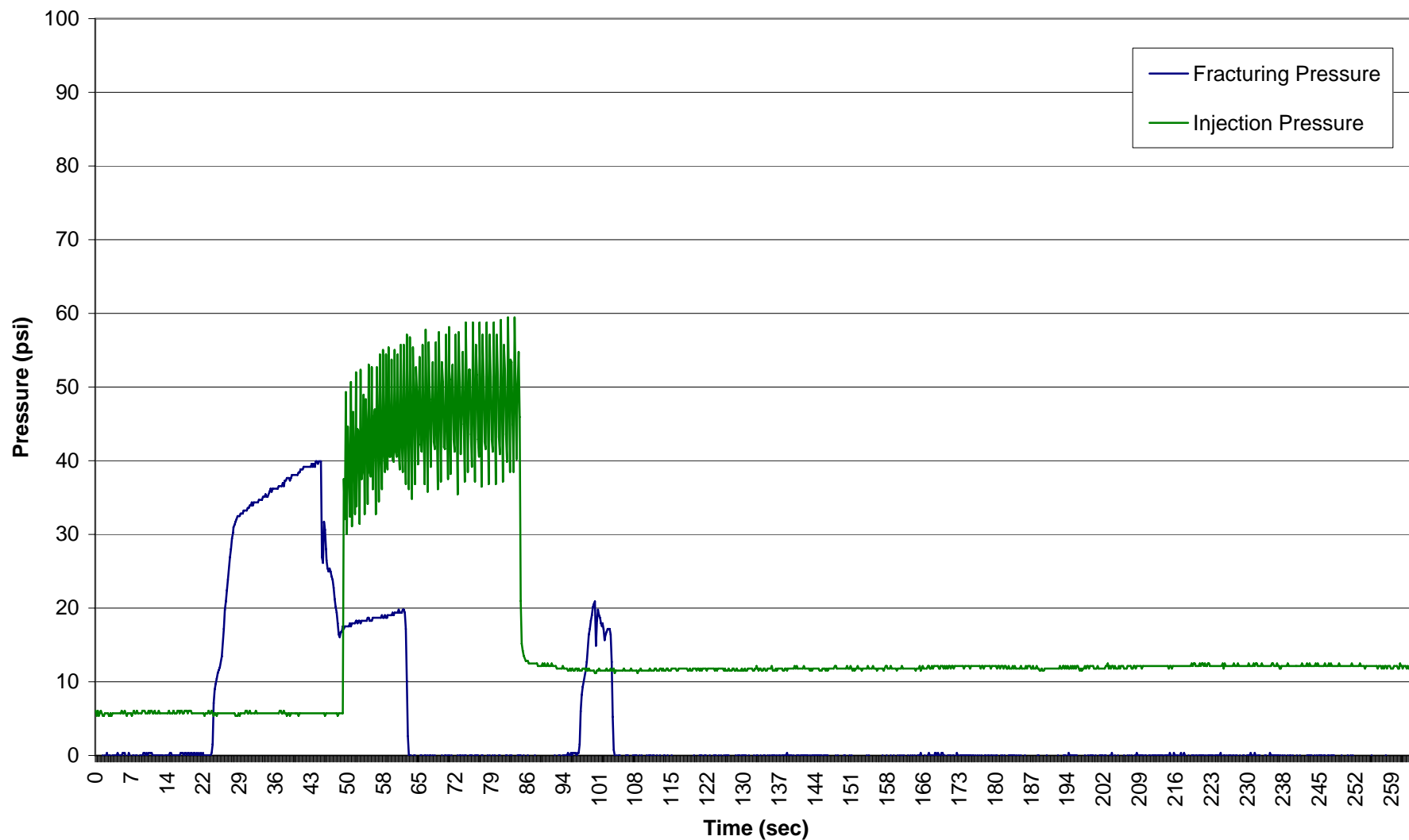
Pressure Time History Curve
IP-2

11 ft bgs, North



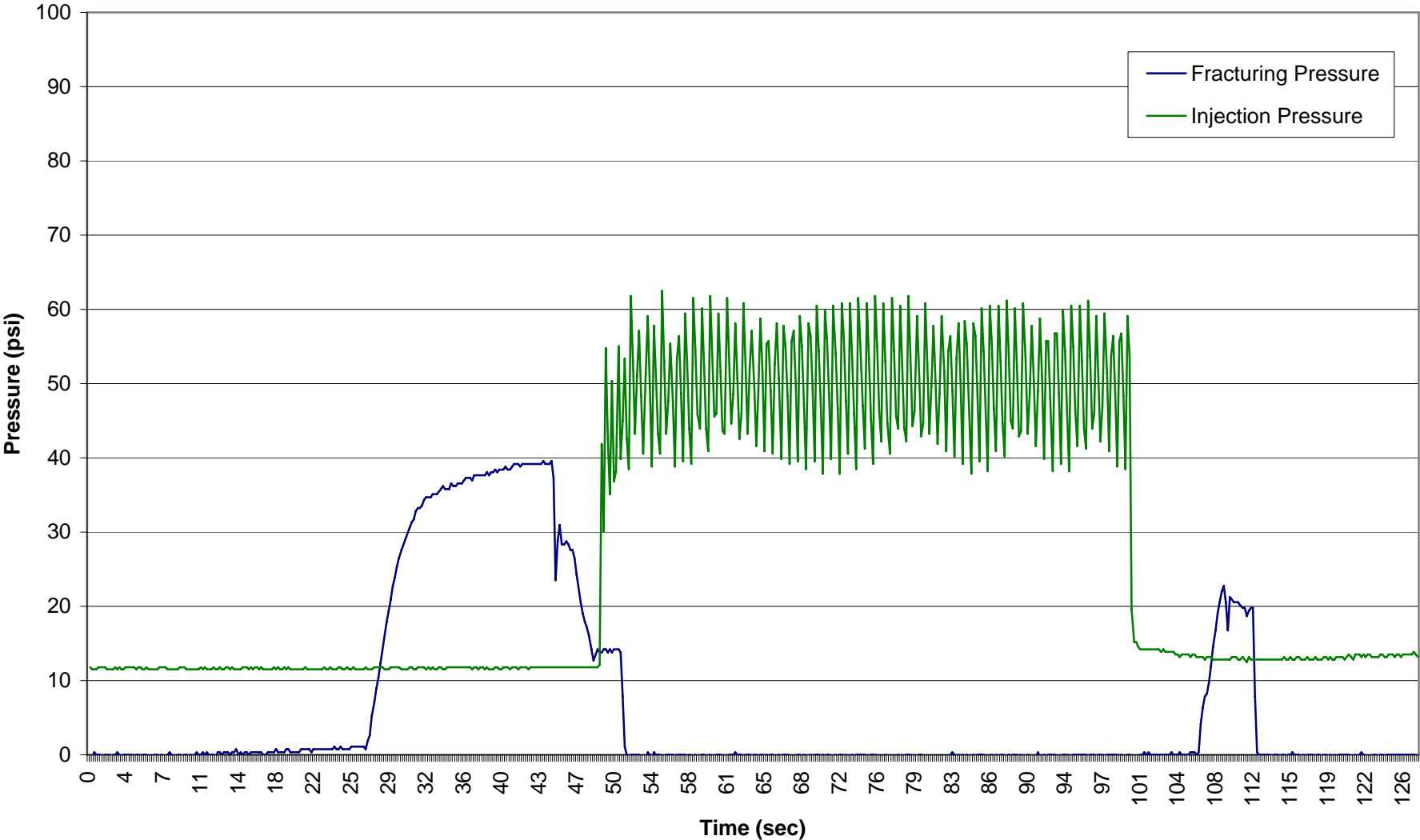
Pressure Time History Curve
IP-2

9 ft bgs, North



Pressure Time History Curve
IP-2

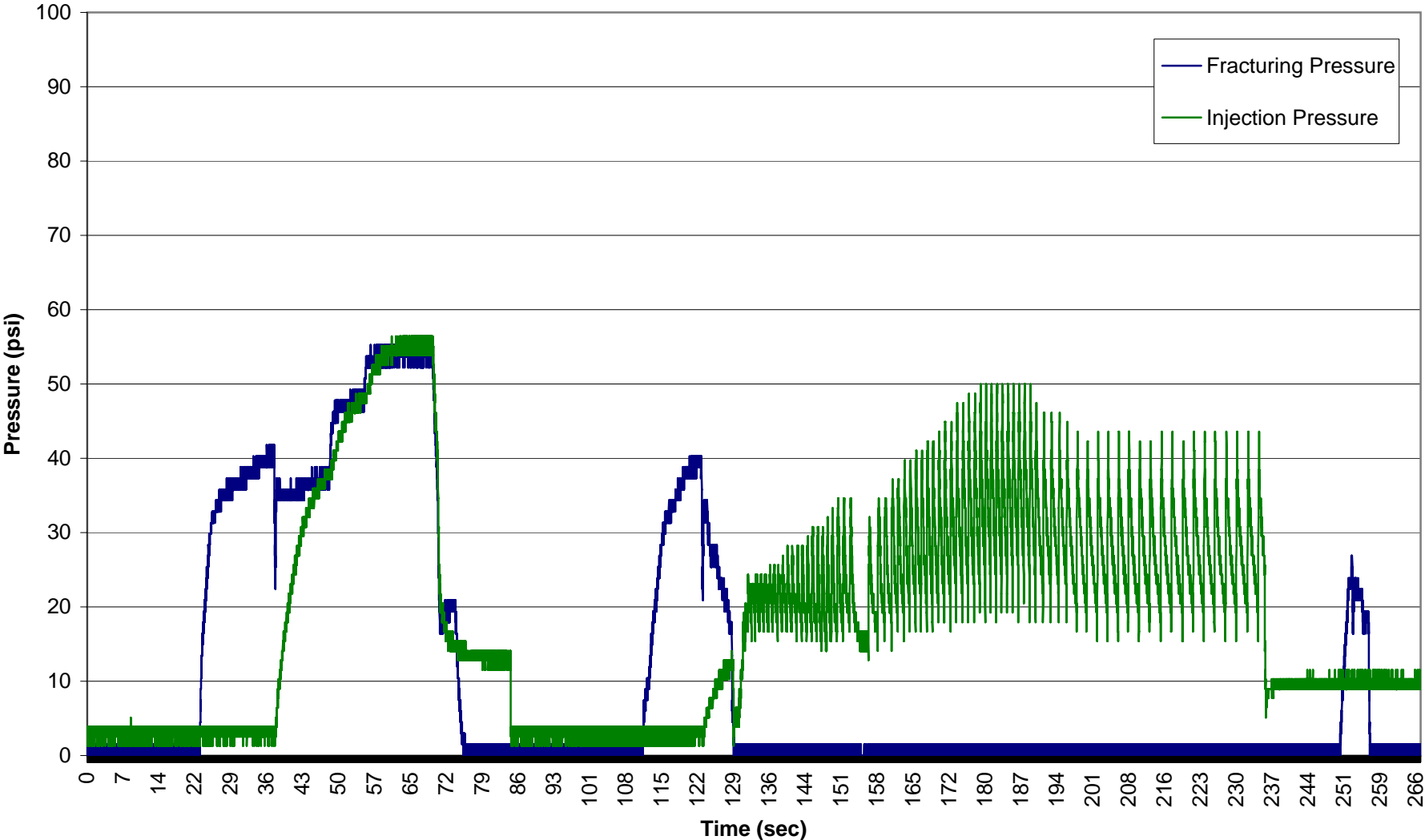
7 ft bgs, North



IP-3

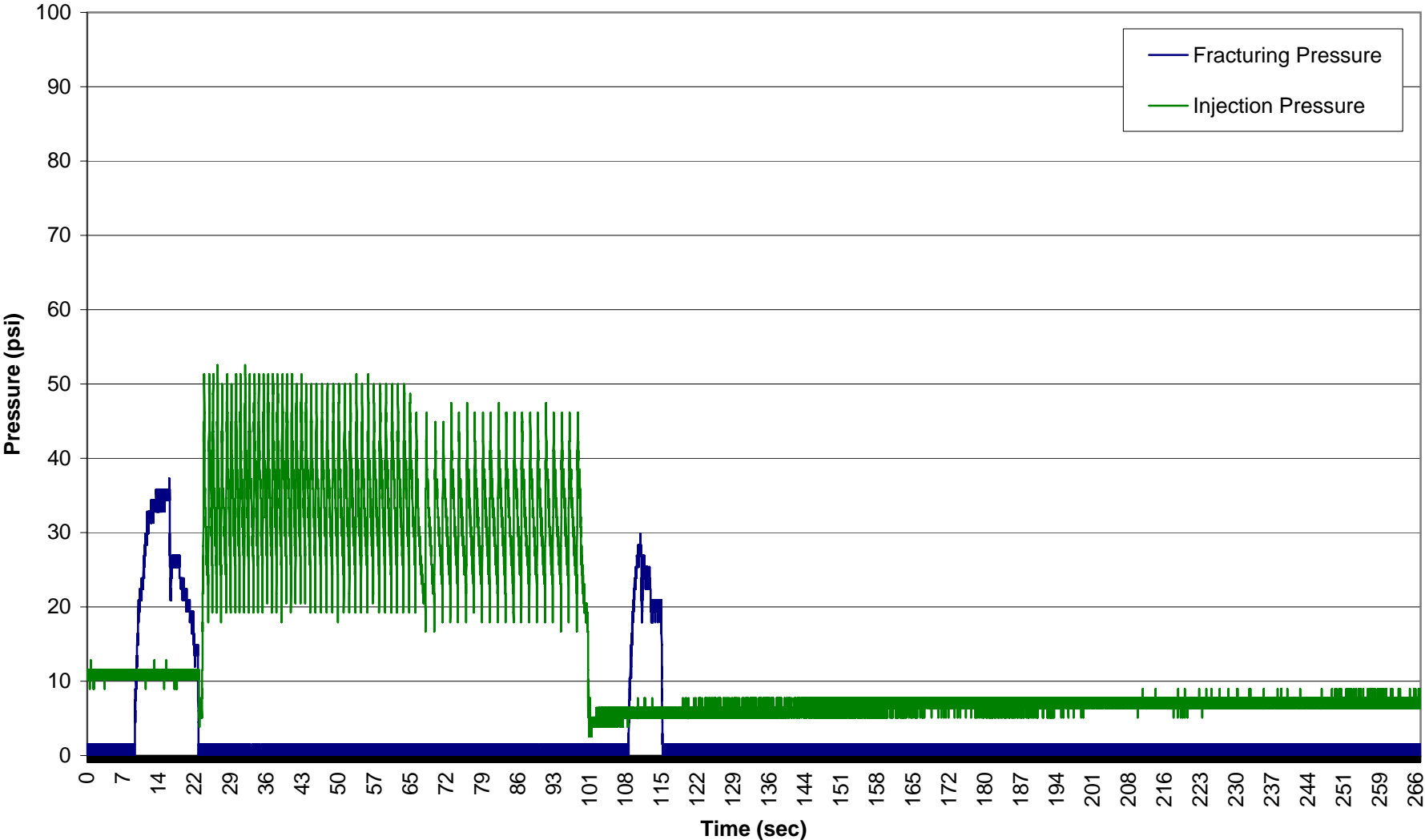
Pressure Time History Curve
IP-3

17 ft bgs, West



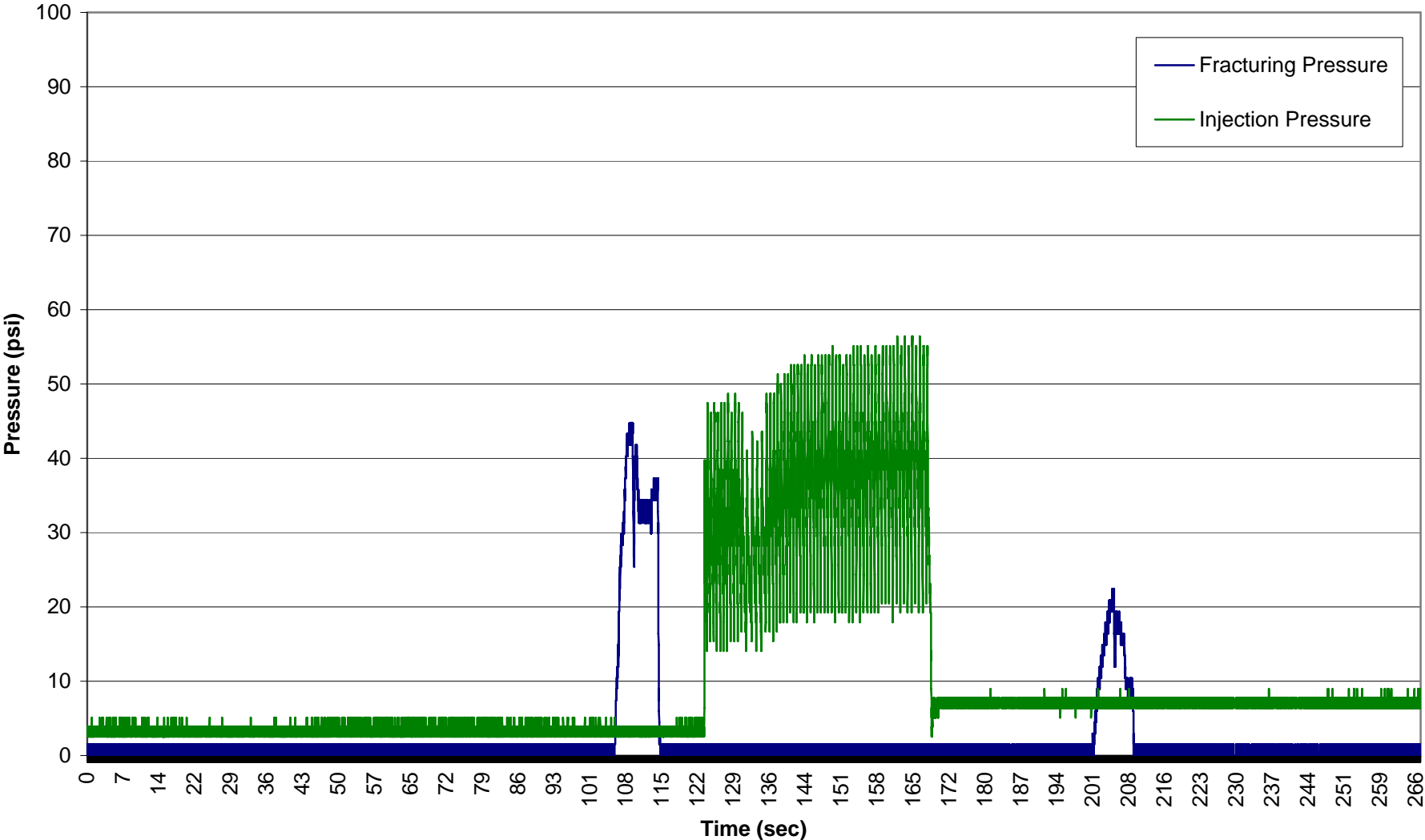
Pressure Time History Curve
IP-3

15 ft bgs, West



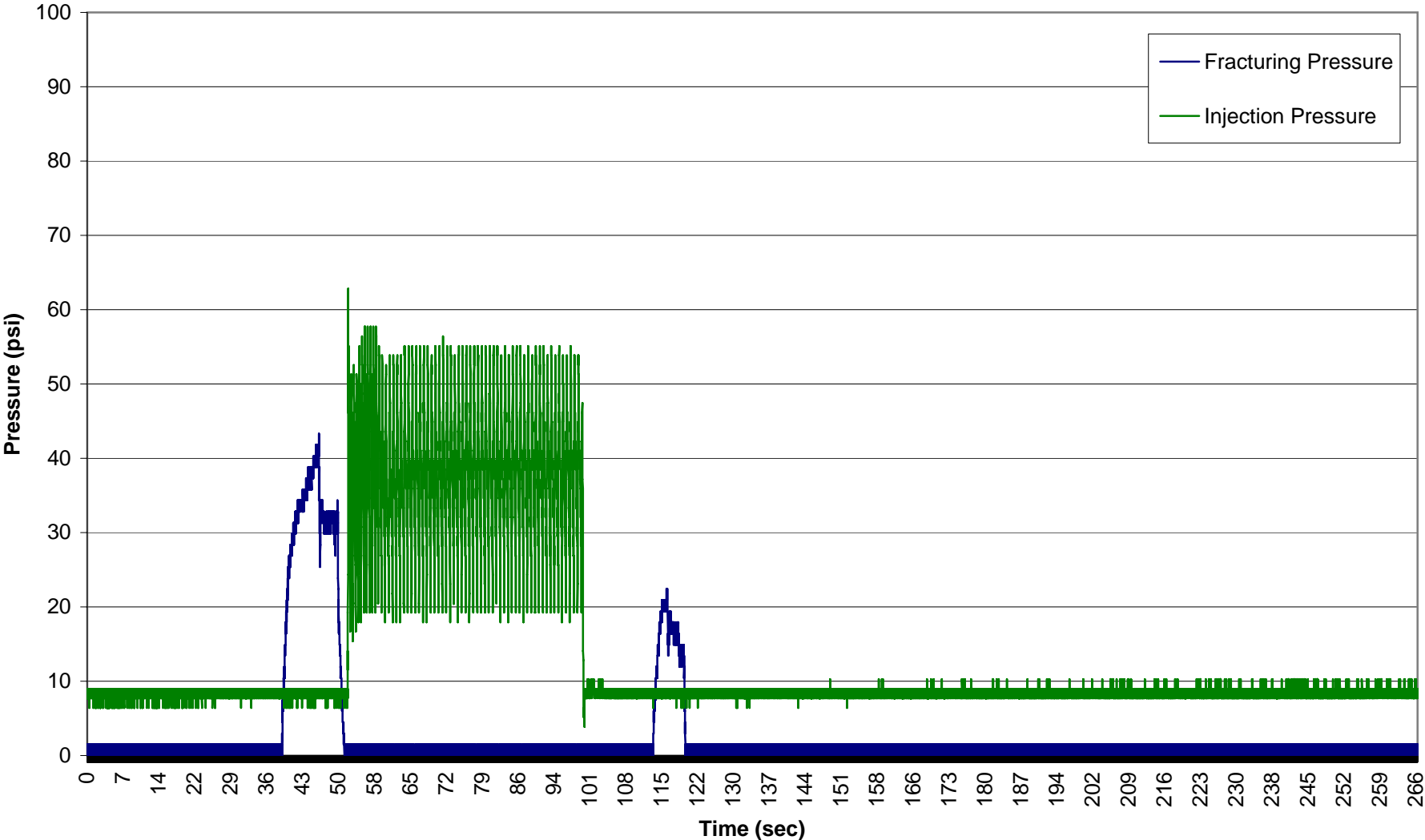
Pressure Time History Curve
IP-3

13 ft bgs, West



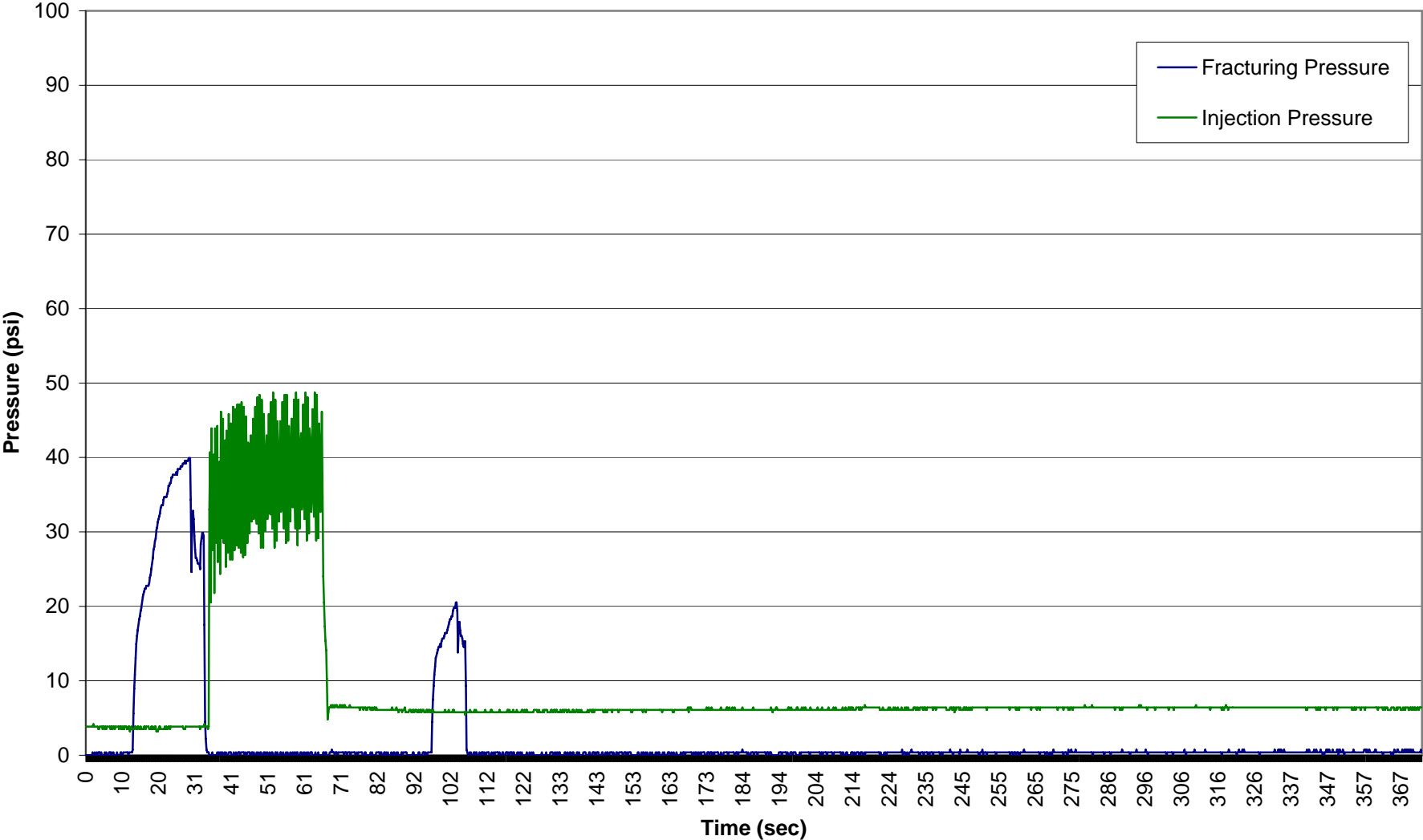
Pressure Time History Curve
IP-3

11 ft bgs, West



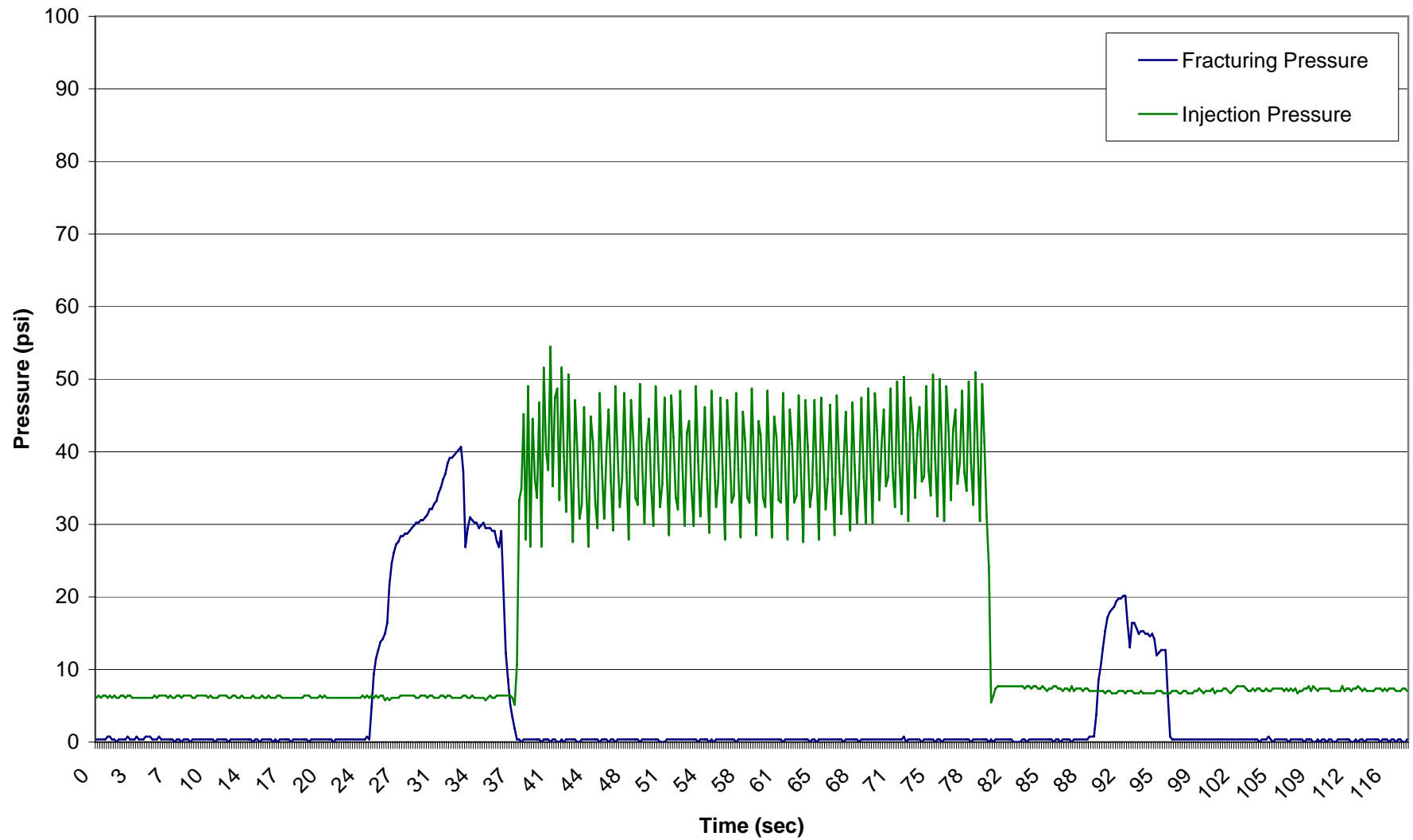
Pressure Time History Curve
IP-3

9 ft bgs, West



Pressure Time History Curve
IP-3

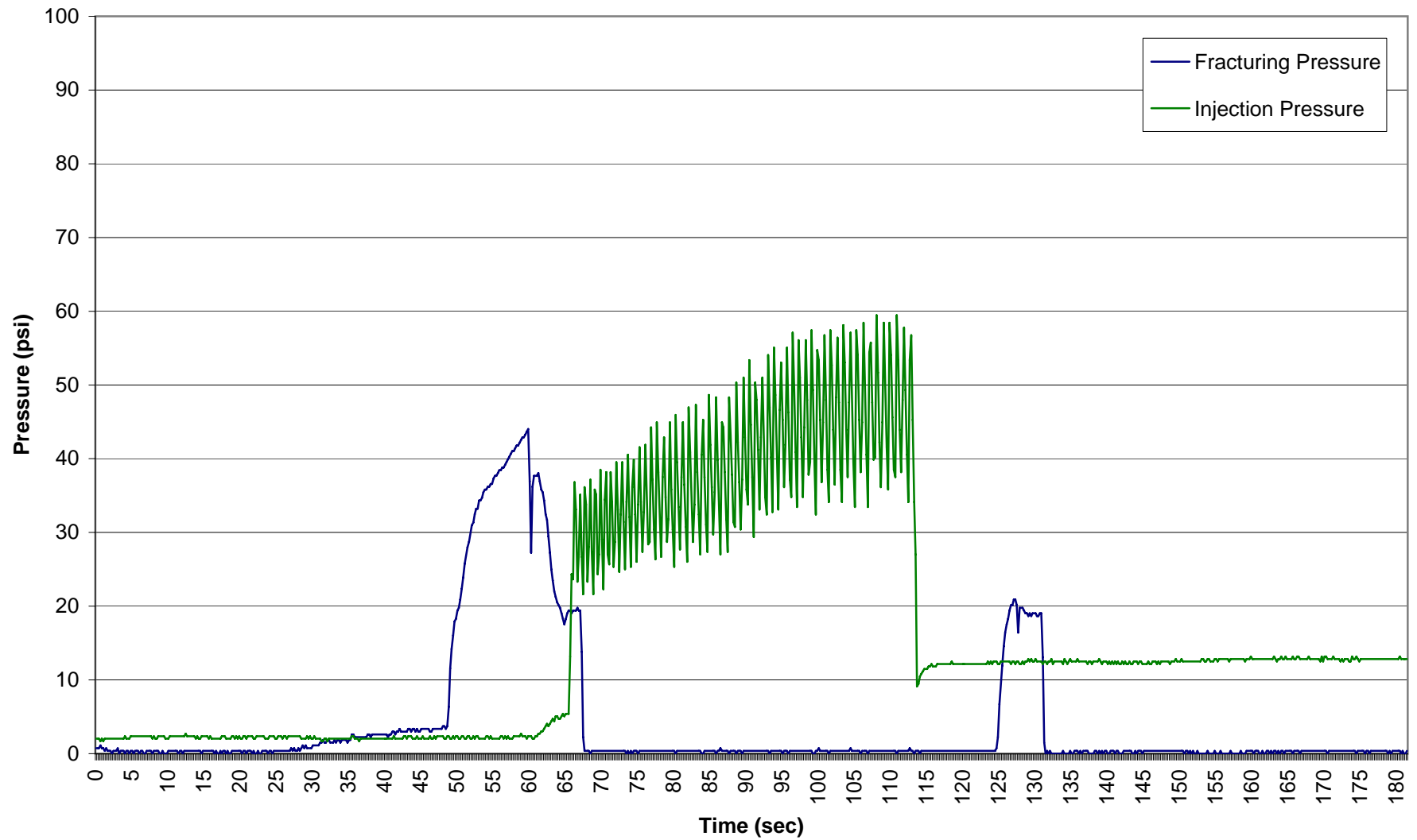
7 ft bgs, West



IP-4

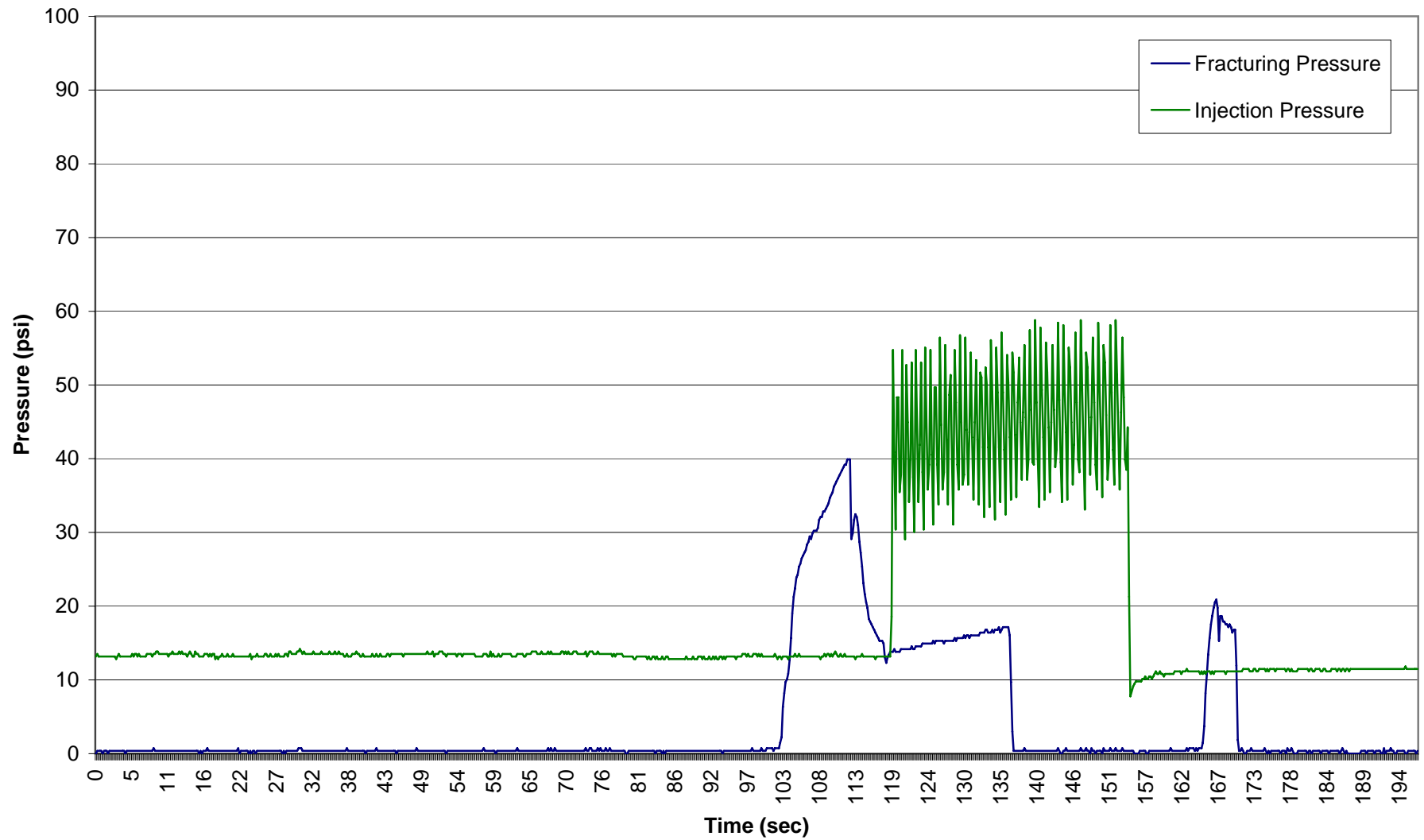
Pressure Time History Curve
IP-4

17.5 ft bgs, South



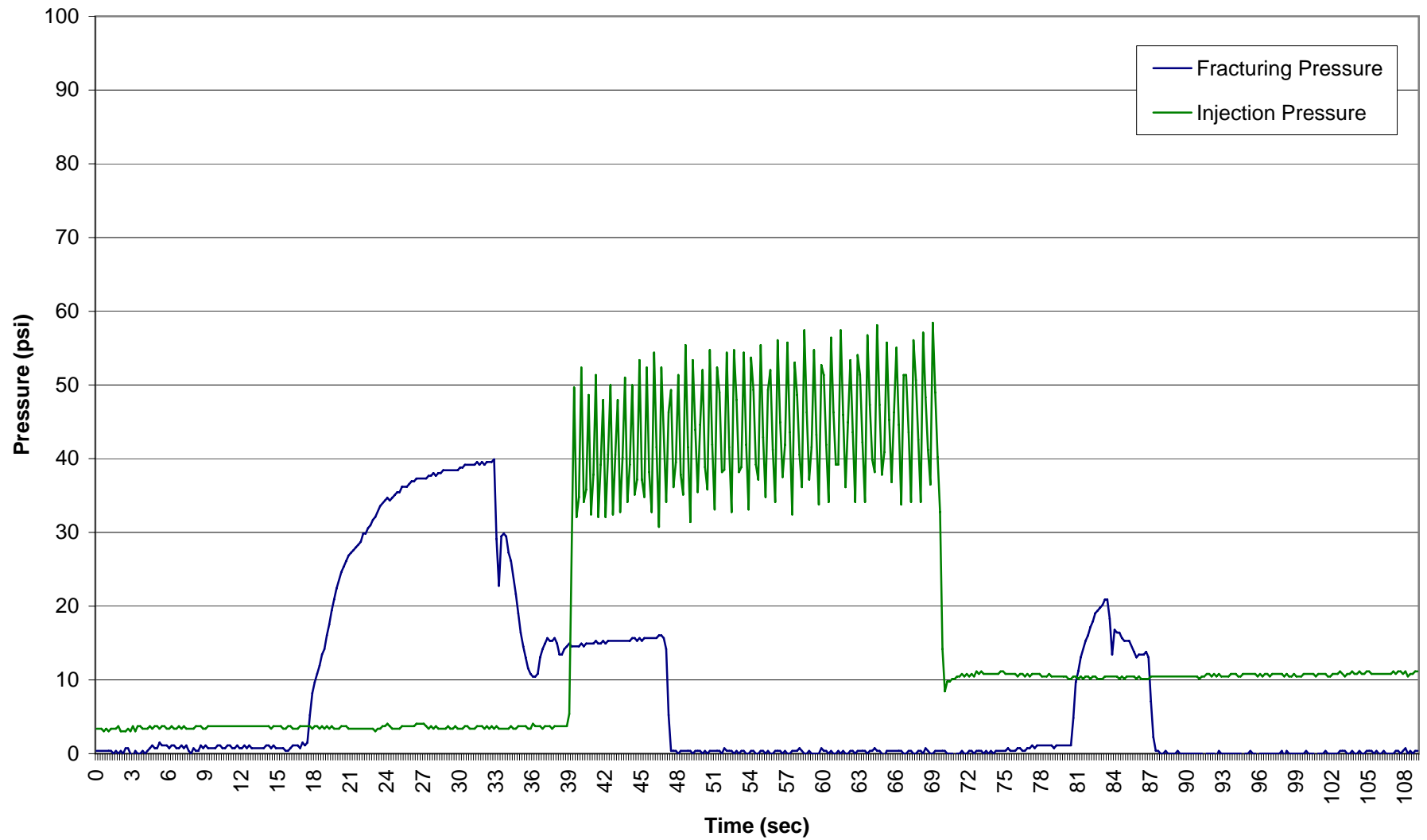
Pressure Time History Curve
IP-4

15.5 ft bgs, South



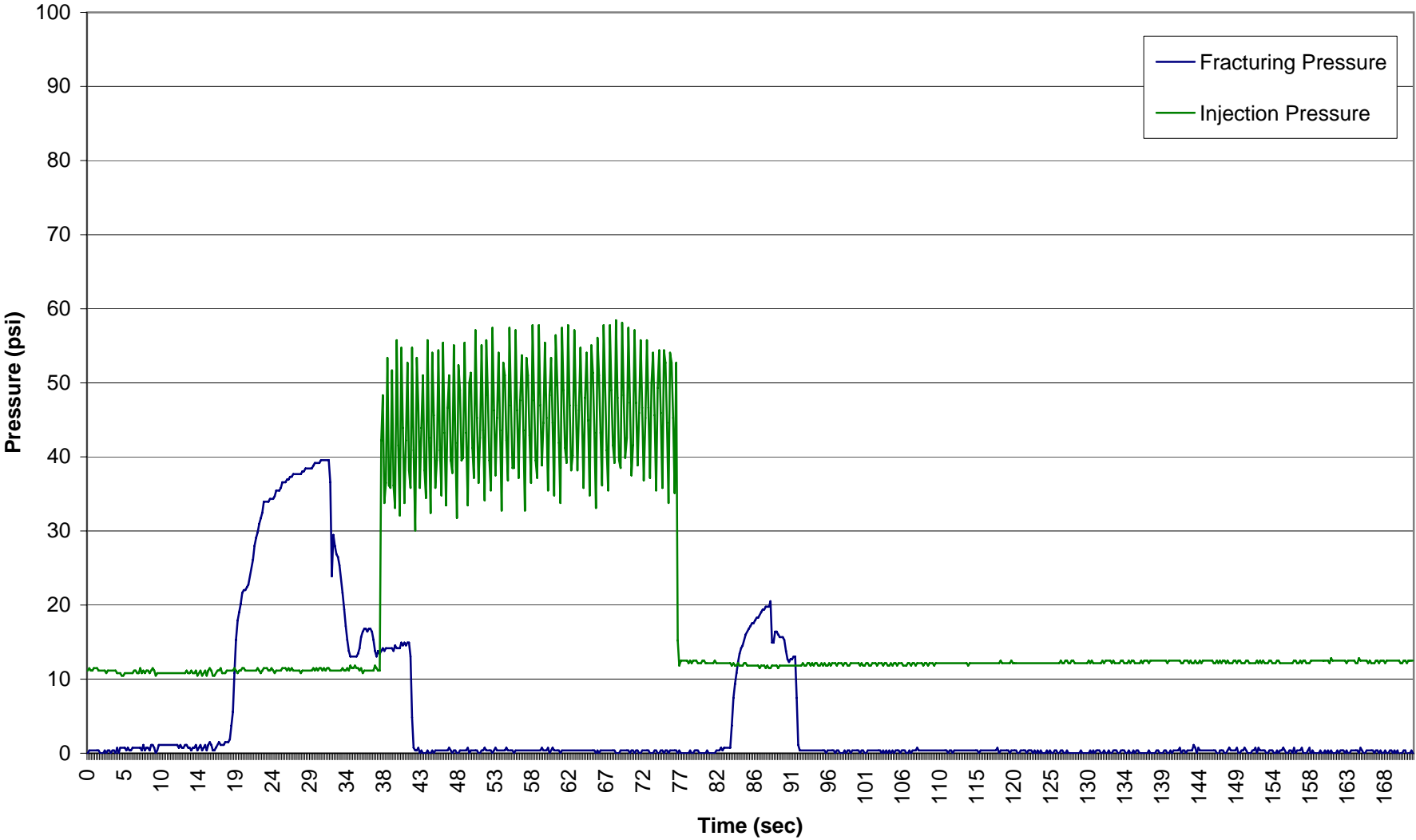
Pressure Time History Curve
IP-4

13.5 ft bgs, South



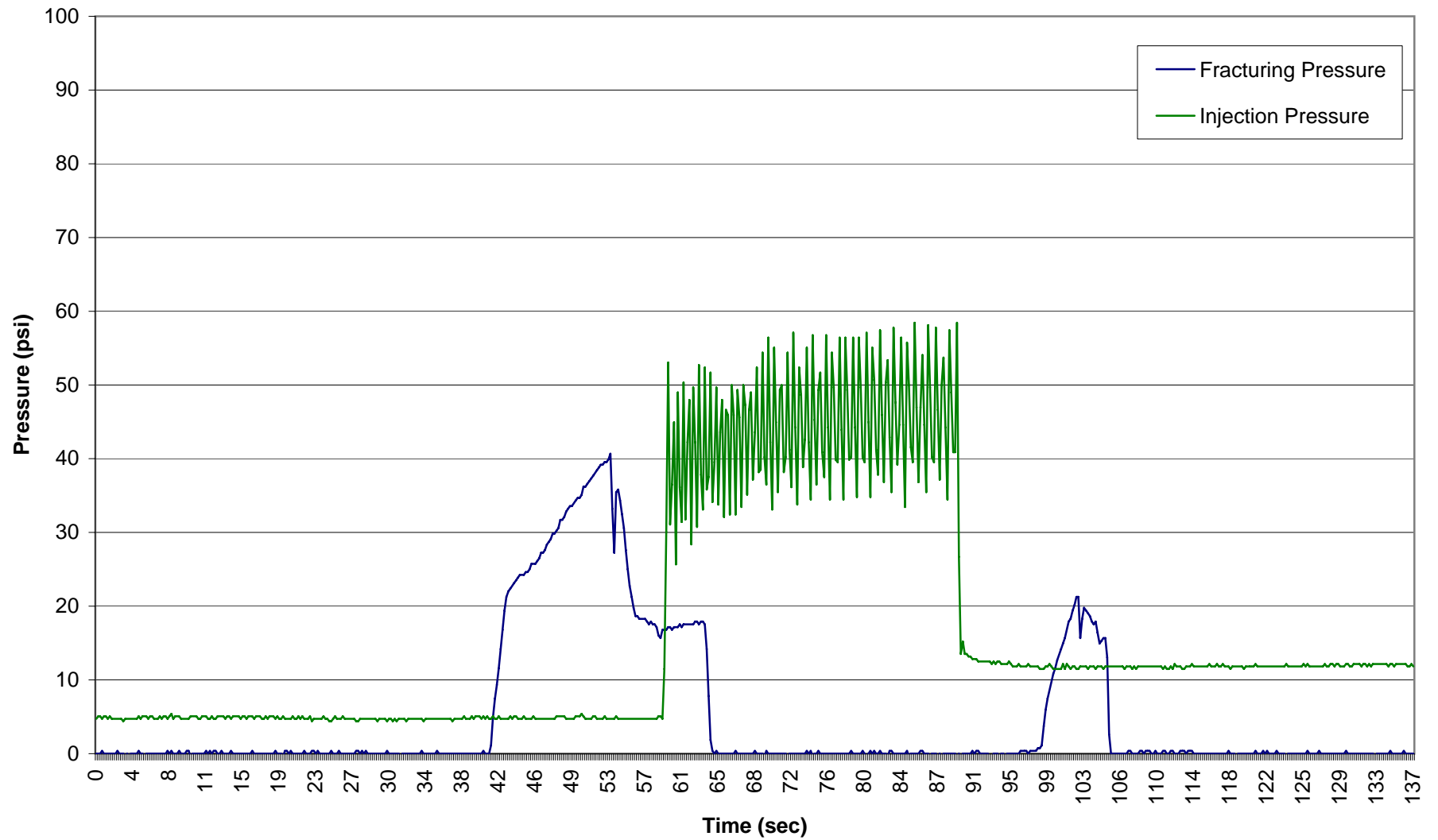
Pressure Time History Curve
IP-4

11.5 ft bgs, South



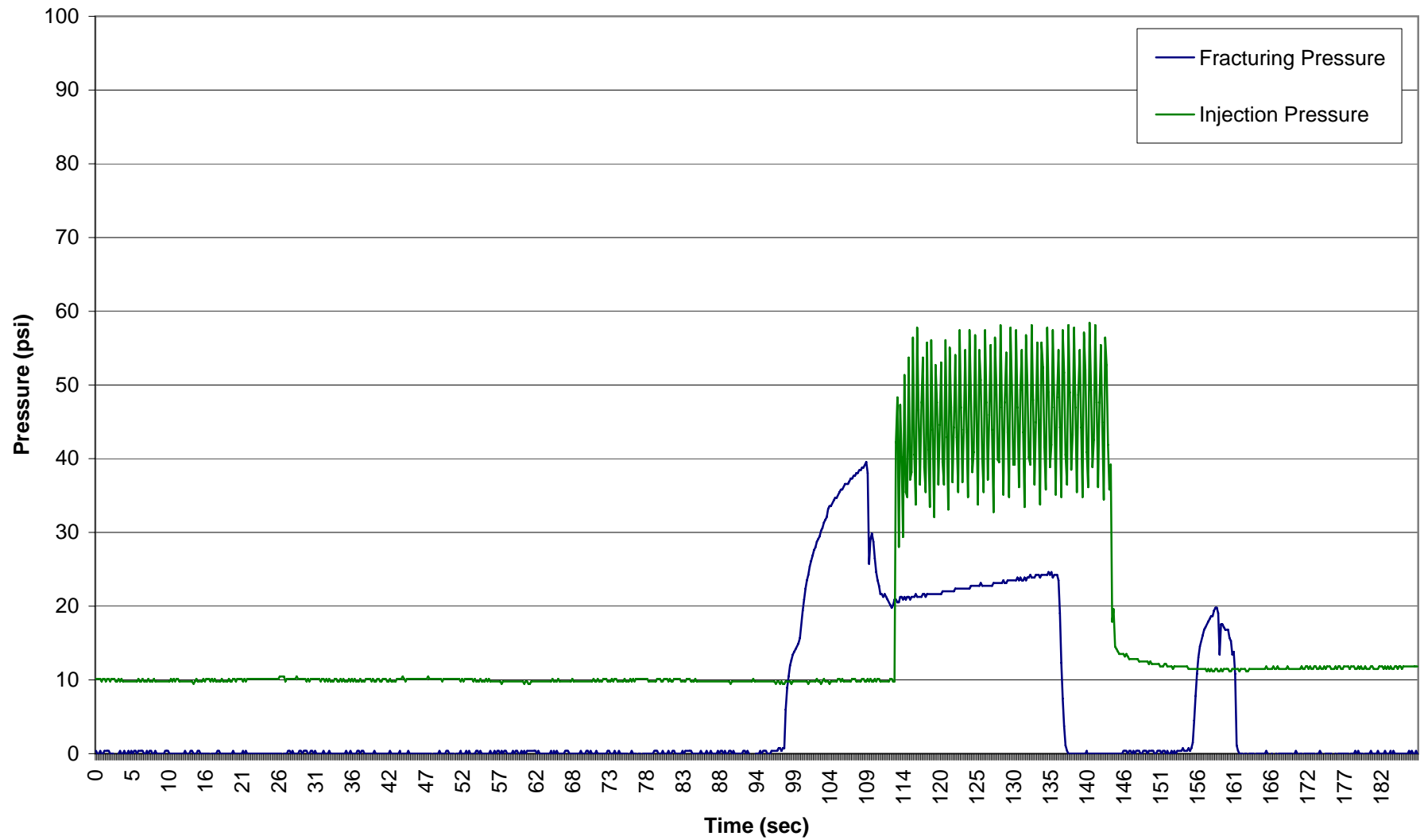
Pressure Time History Curve
IP-4

9.5 ft bgs, South



Pressure Time History Curve
IP-4

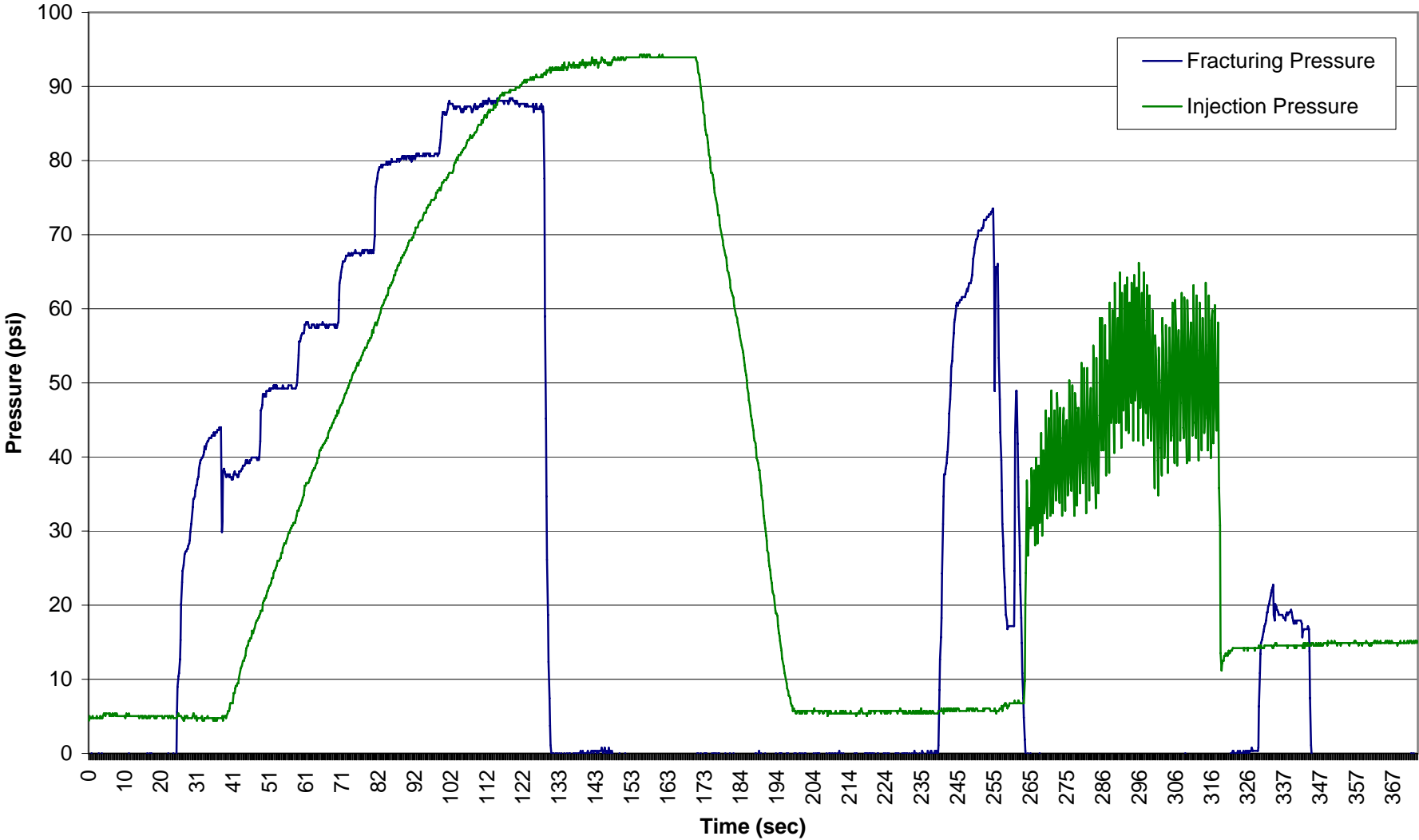
7.5 ft bgs, South



IP-5

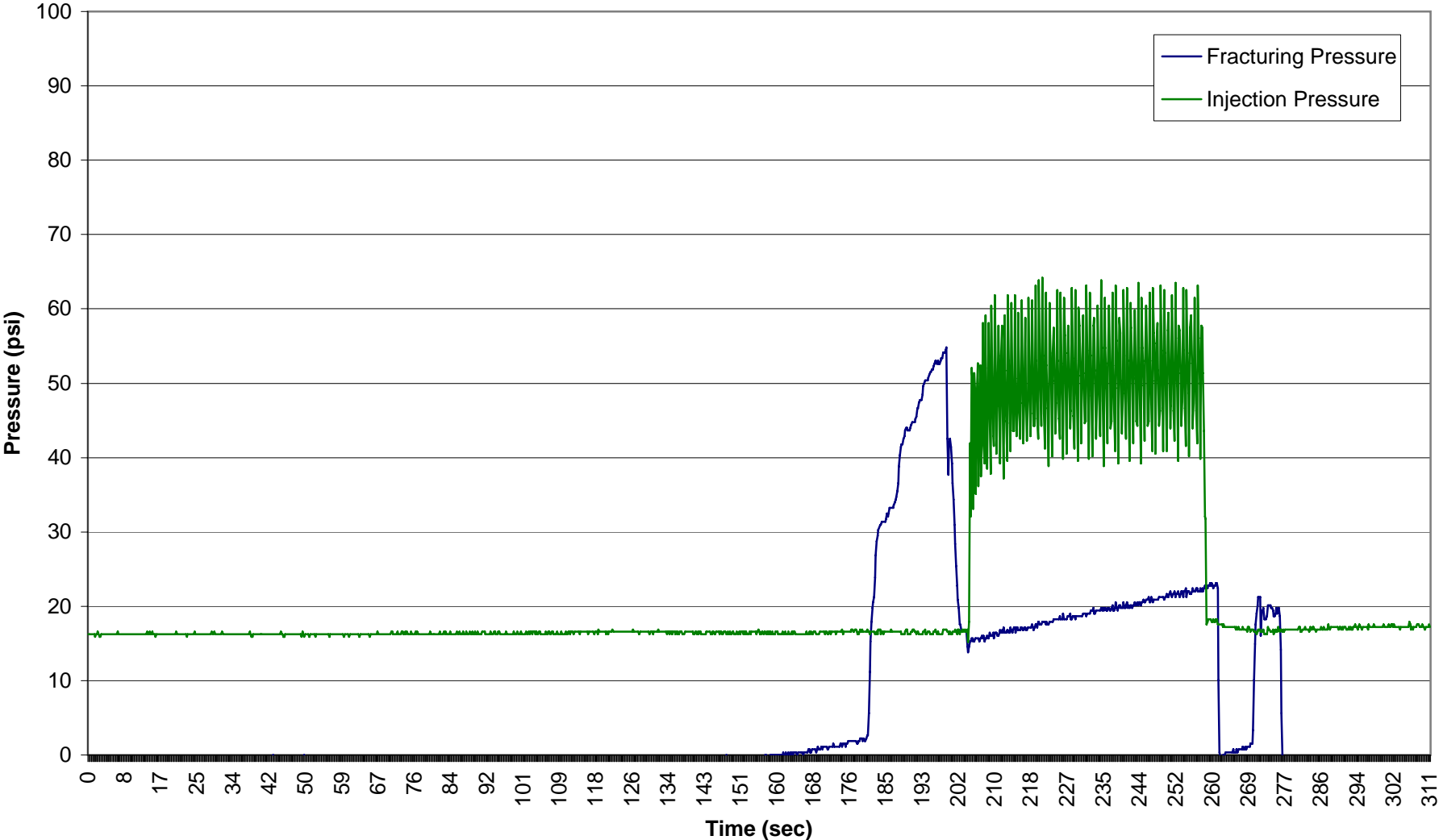
Pressure Time History Curve
IP-5

18.5 ft bgs, Northwest



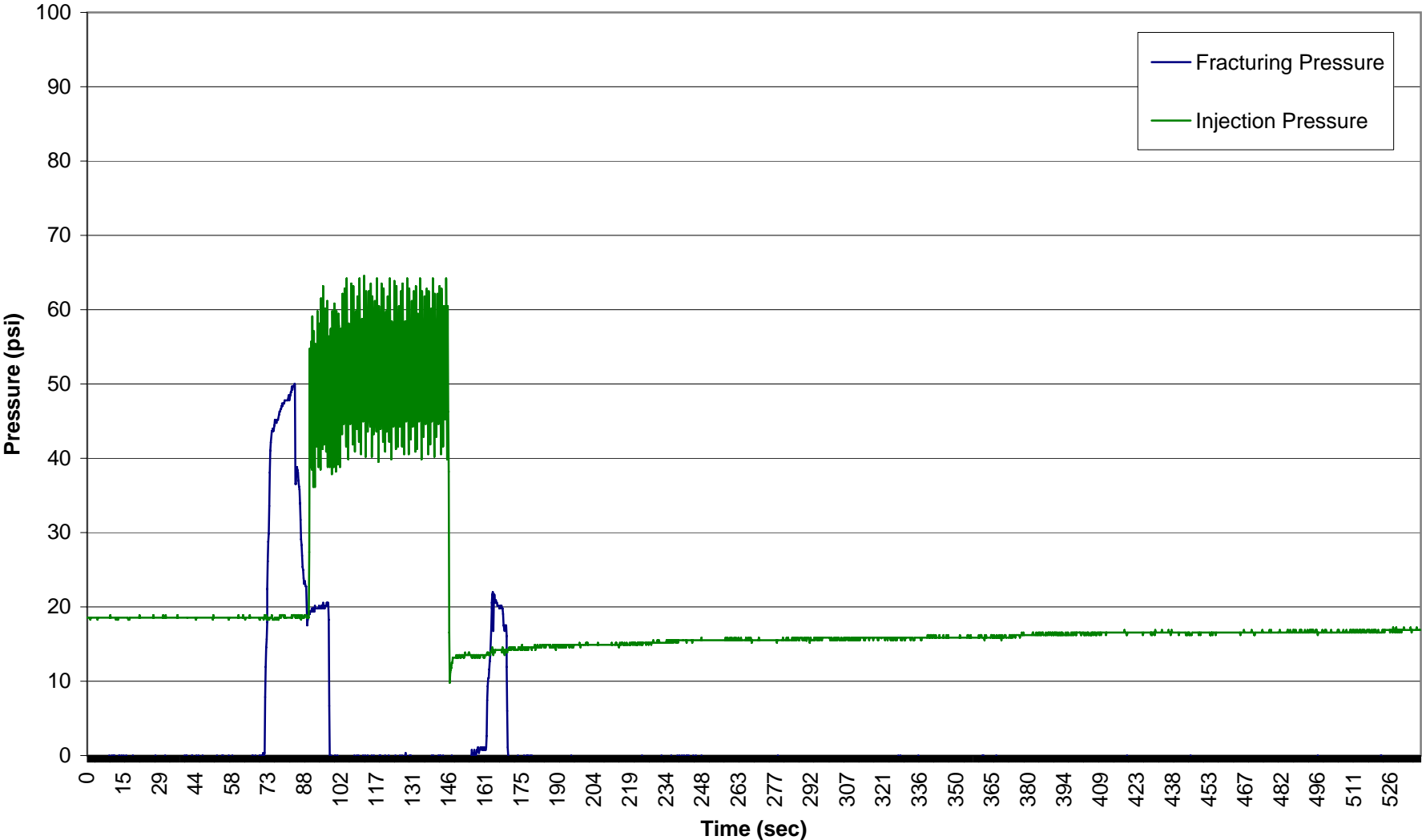
Pressure Time History Curve
IP-5

18.5 ft bgs, Northeast



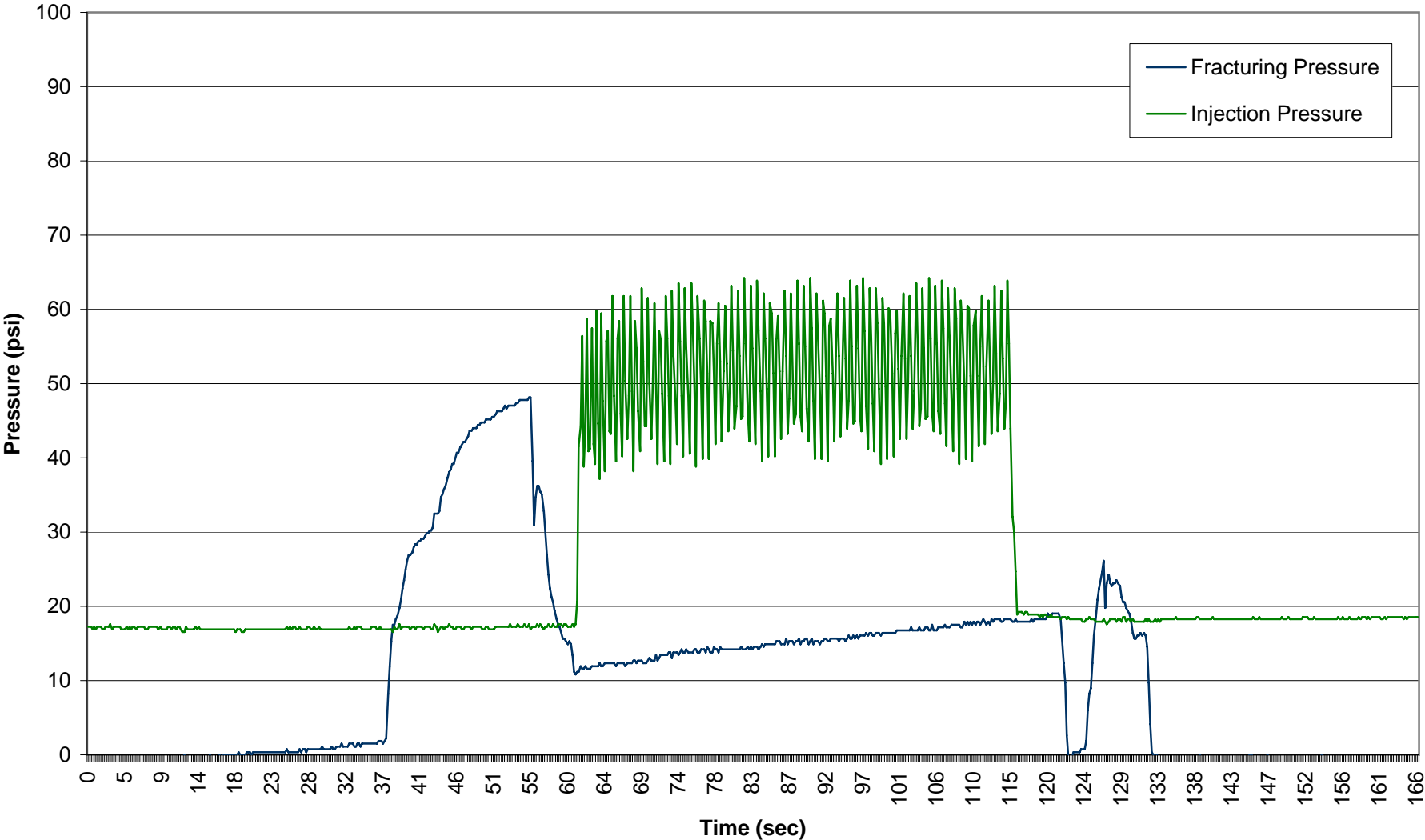
Pressure Time History Curve
IP-5

18.5 ft bgs, Southeast



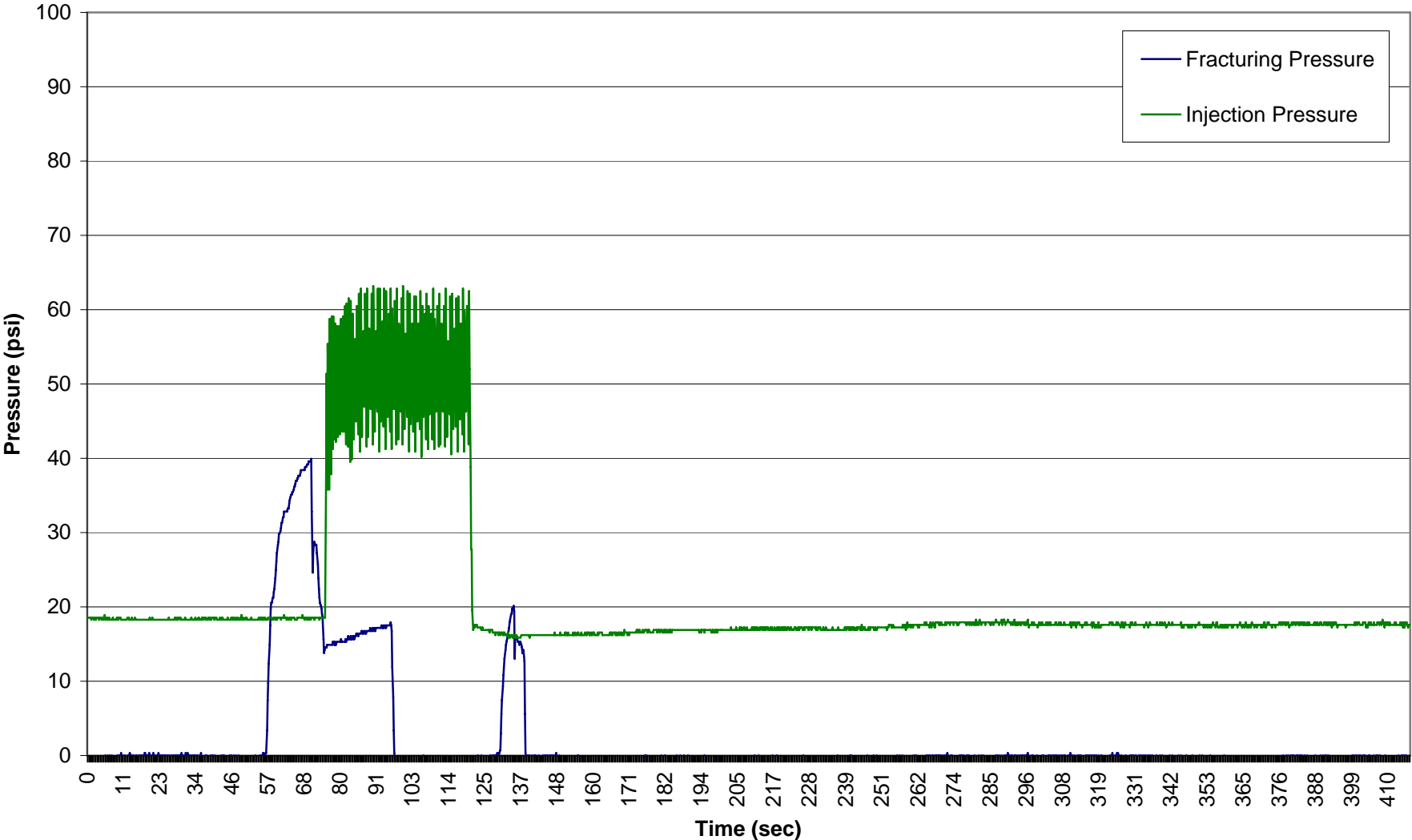
Pressure Time History Curve
IP-5

18.5 ft bgs, Southwest



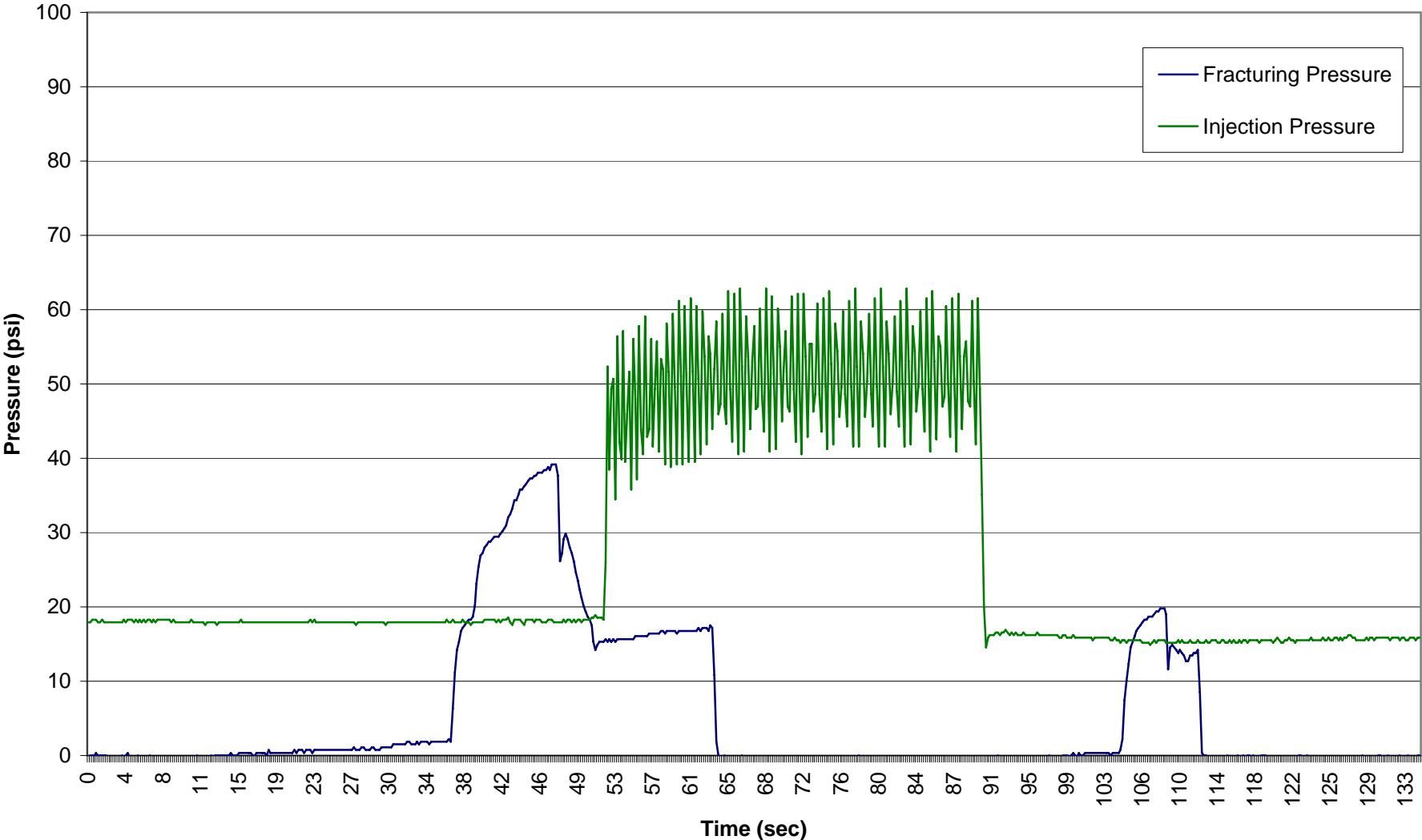
Pressure Time History Curve
IP-5

16.5 ft bgs, Southwest



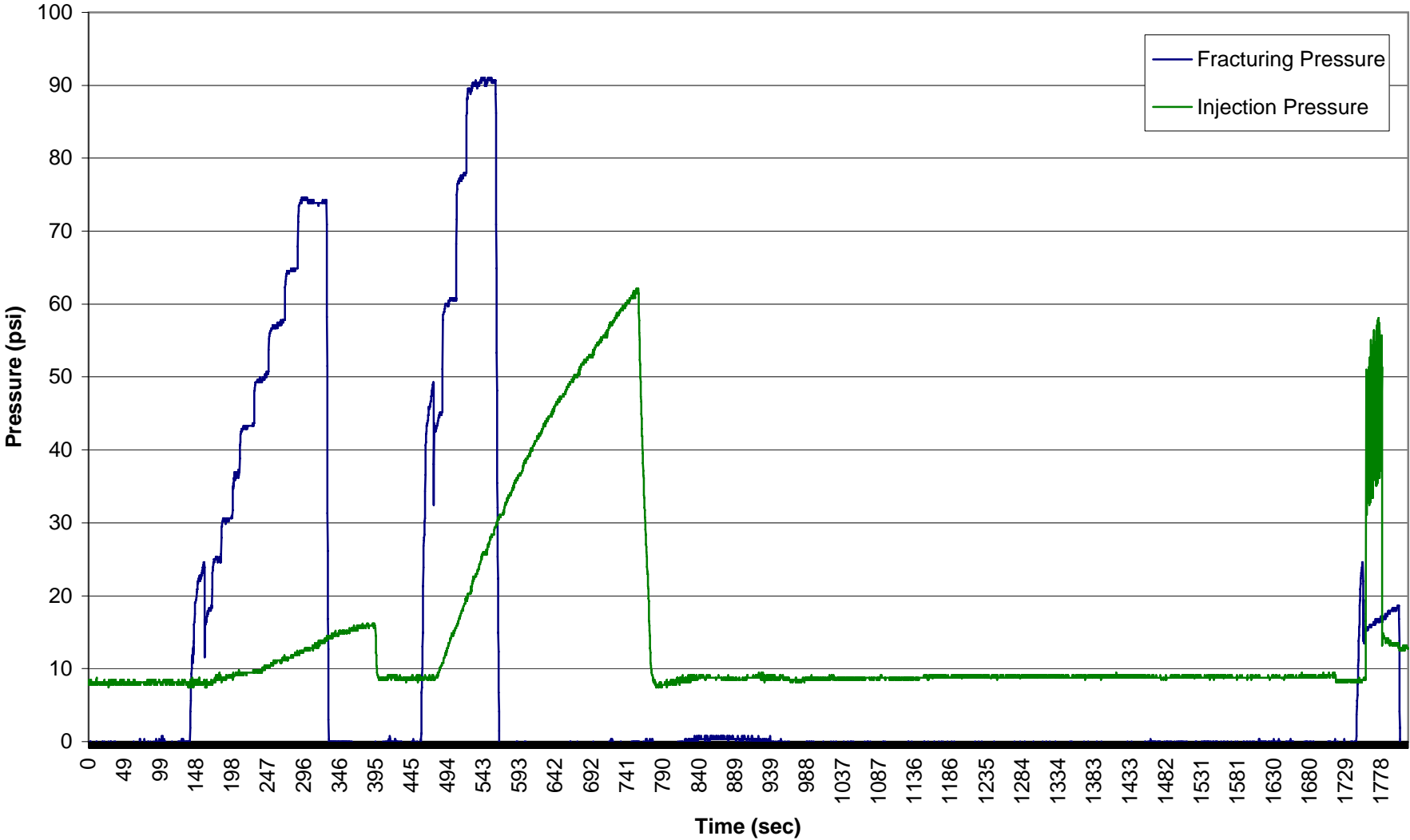
Pressure Time History Curve
IP-5

16.5 ft bgs, Northwest



Pressure Time History Curve
IP-5

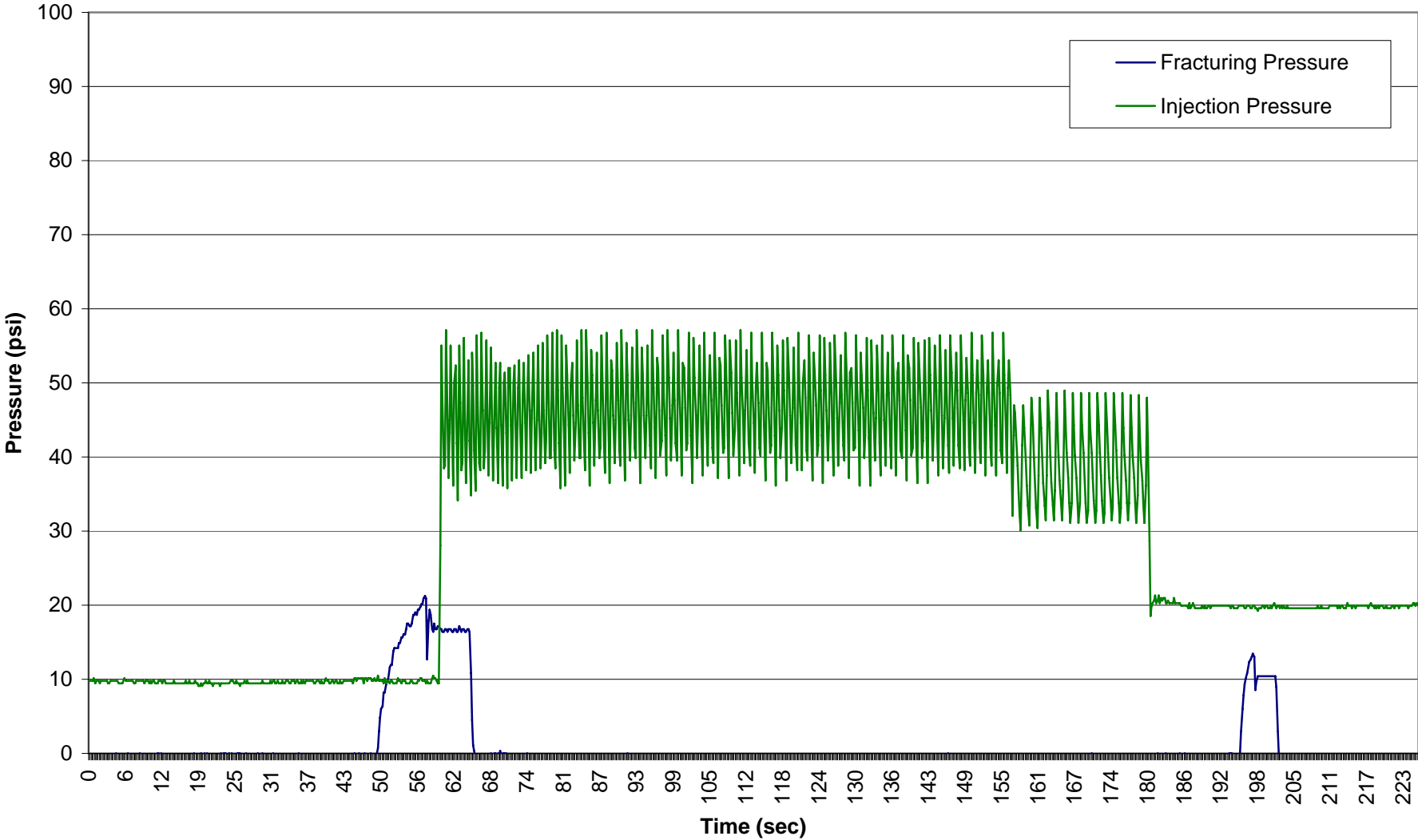
14 ft bgs, Northwest



IP-10

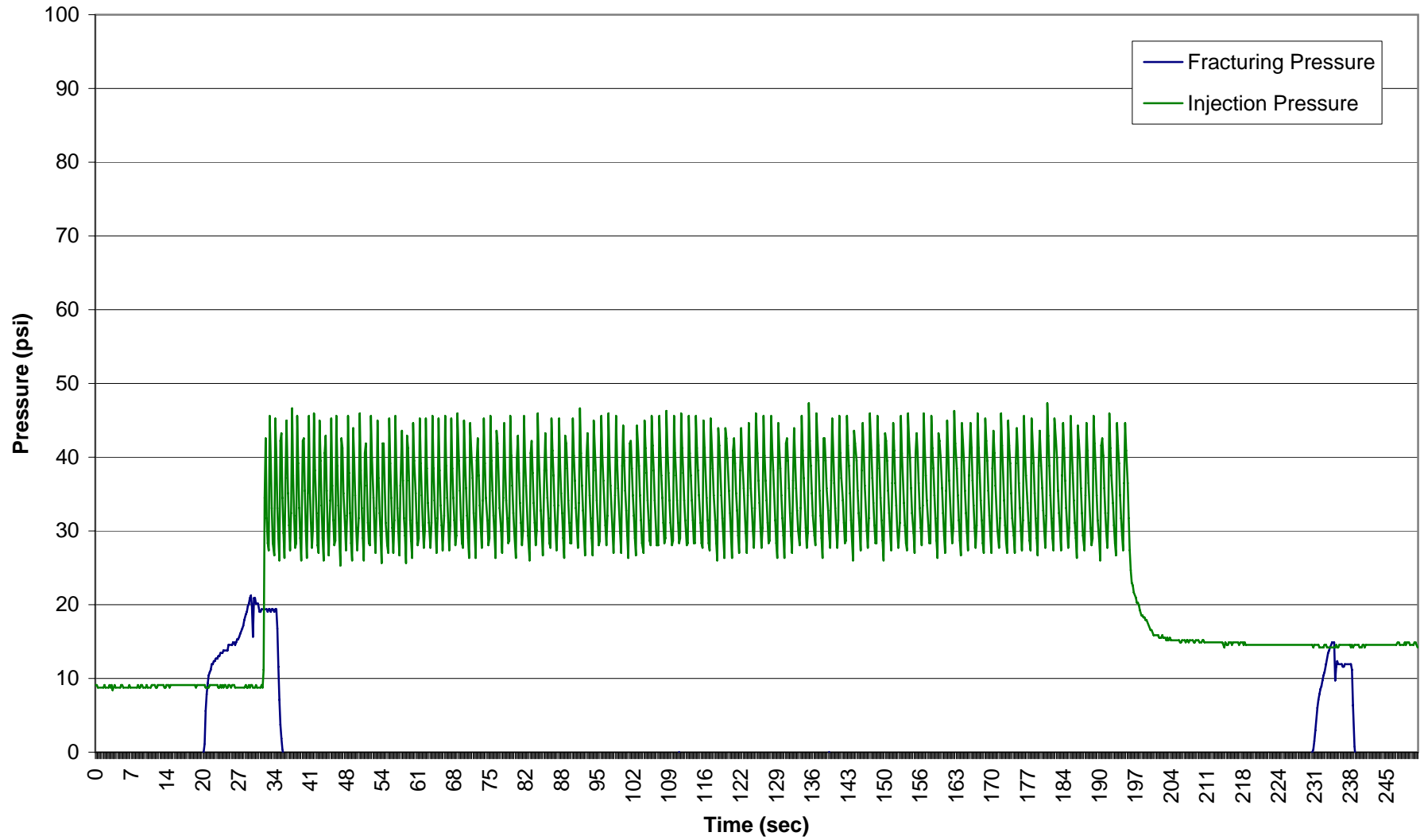
Pressure Time History Curve
IP-10

18 ft bgs, North Northeast



Pressure Time History Curve
IP-10

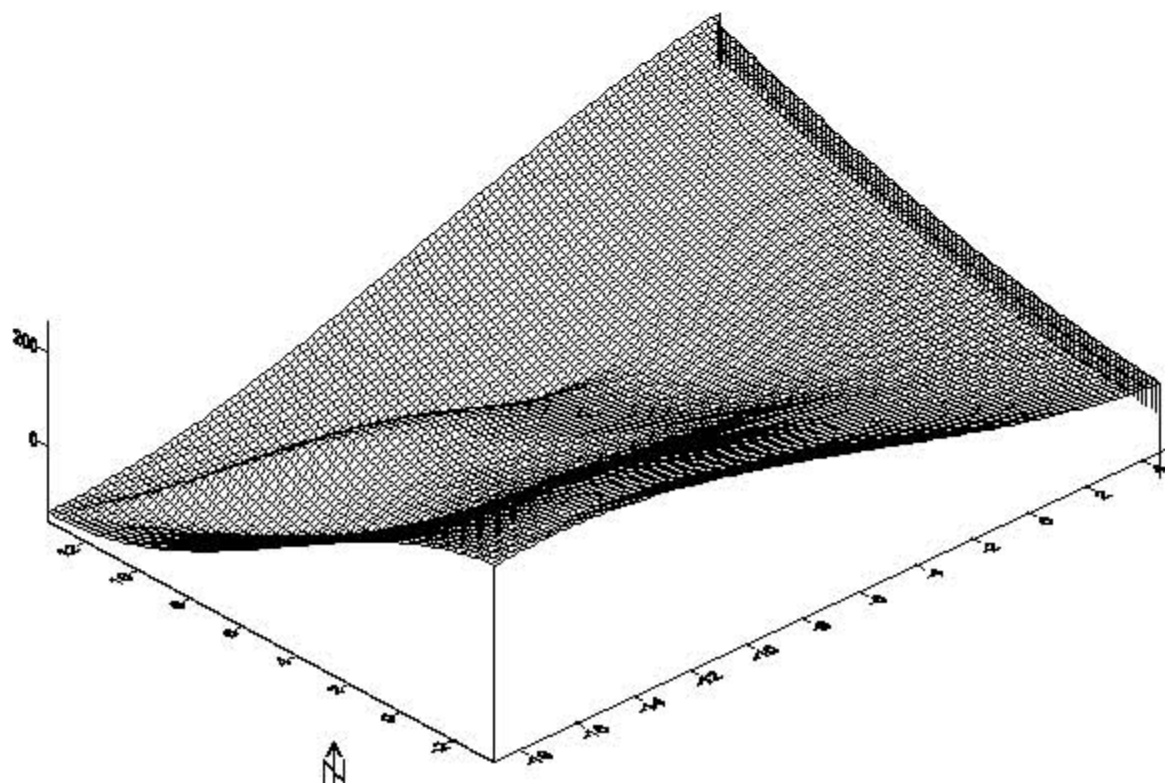
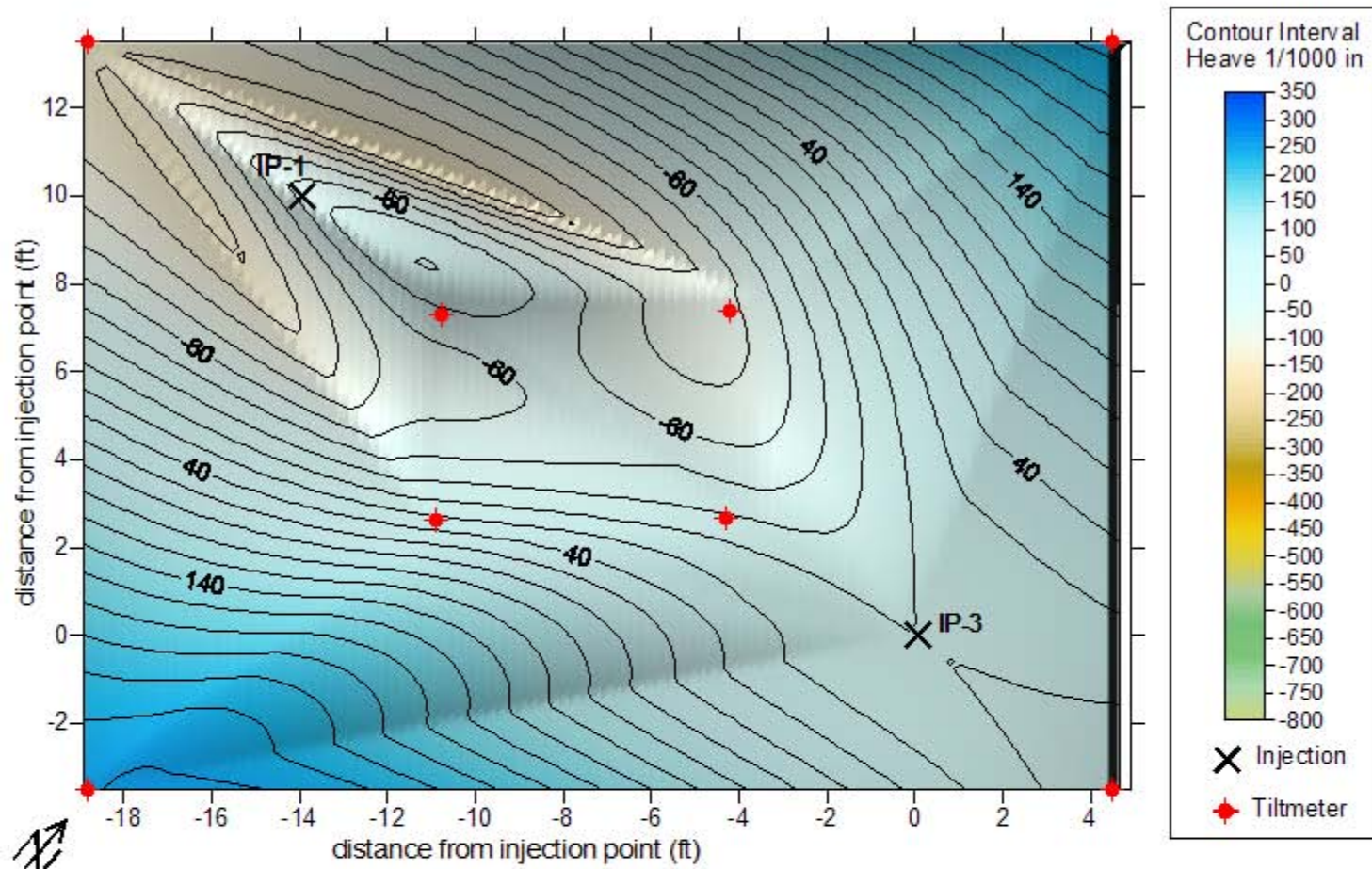
15 ft bgs, North Northeast



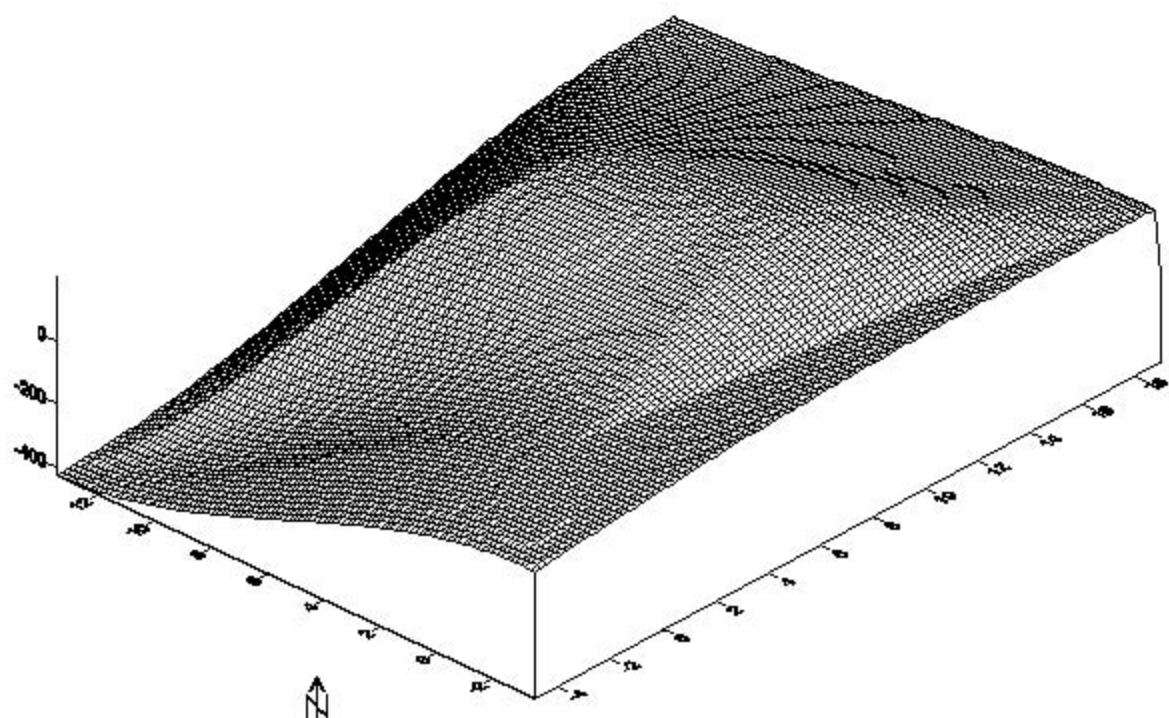
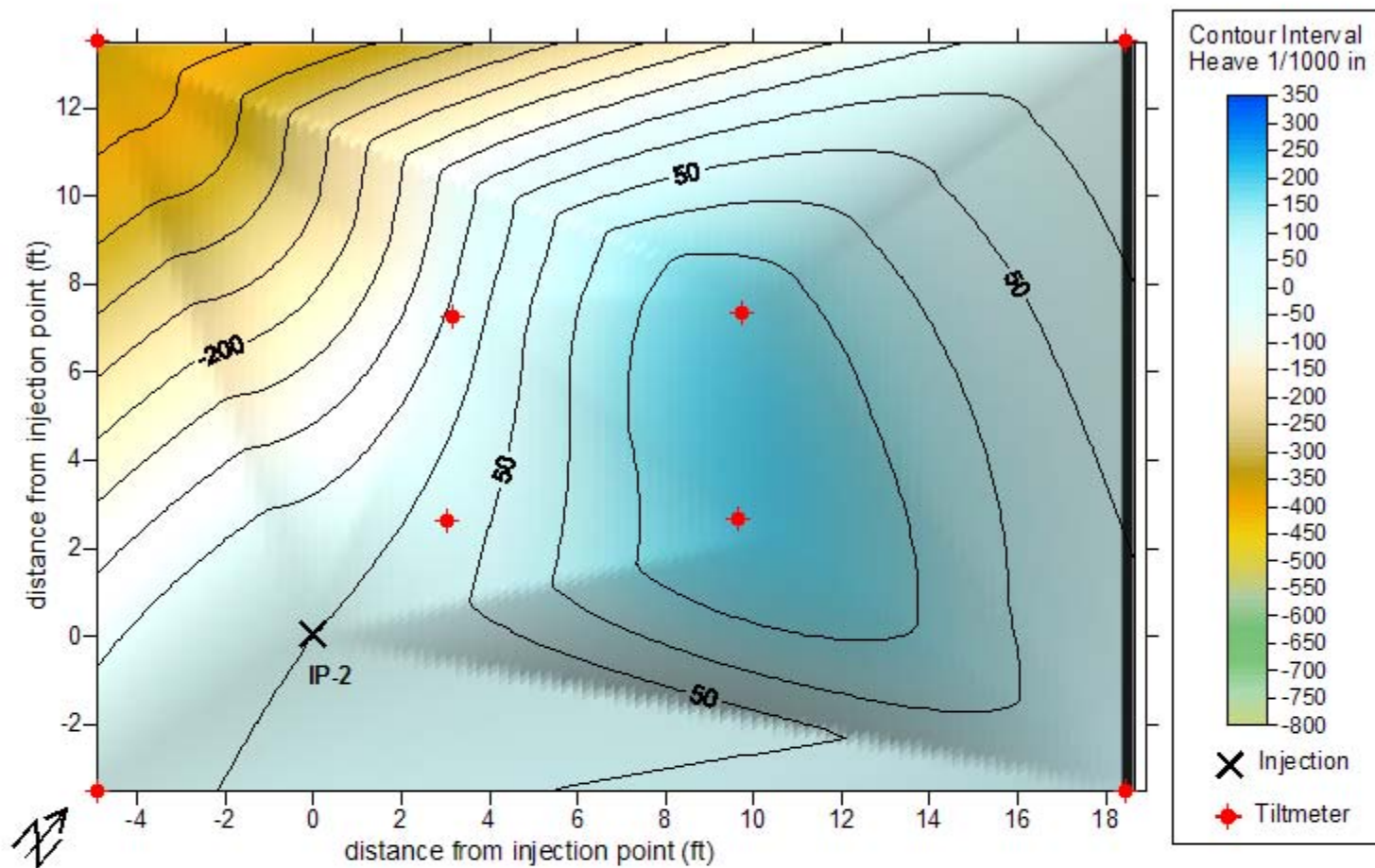
APPENDIX B

Tiltmeter Diagrams

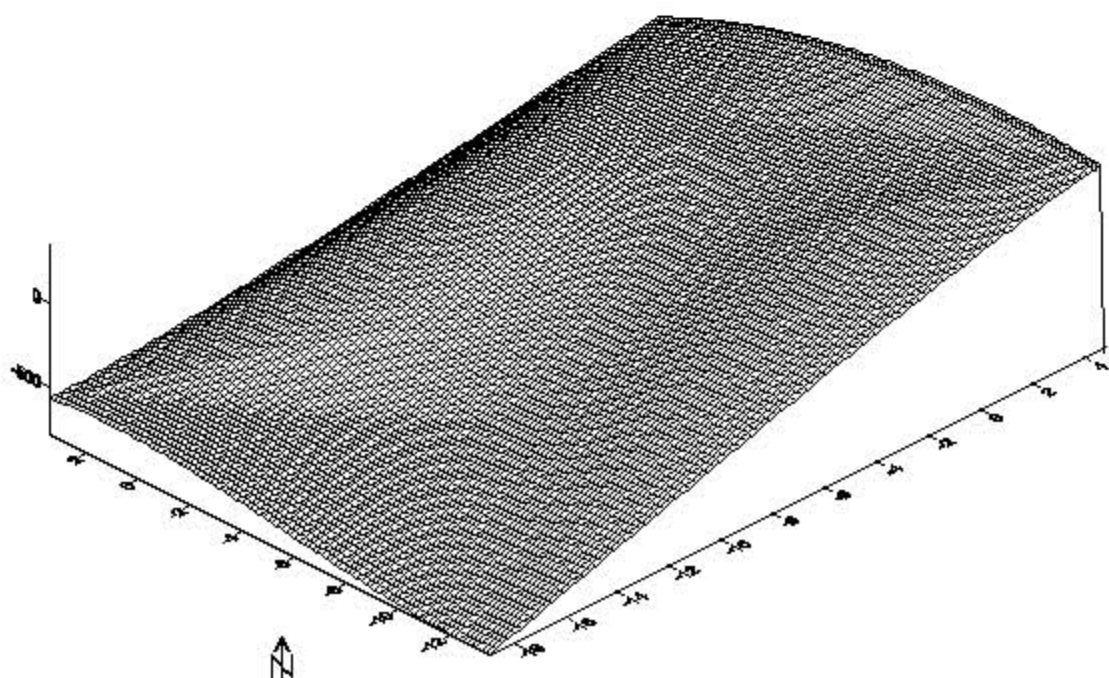
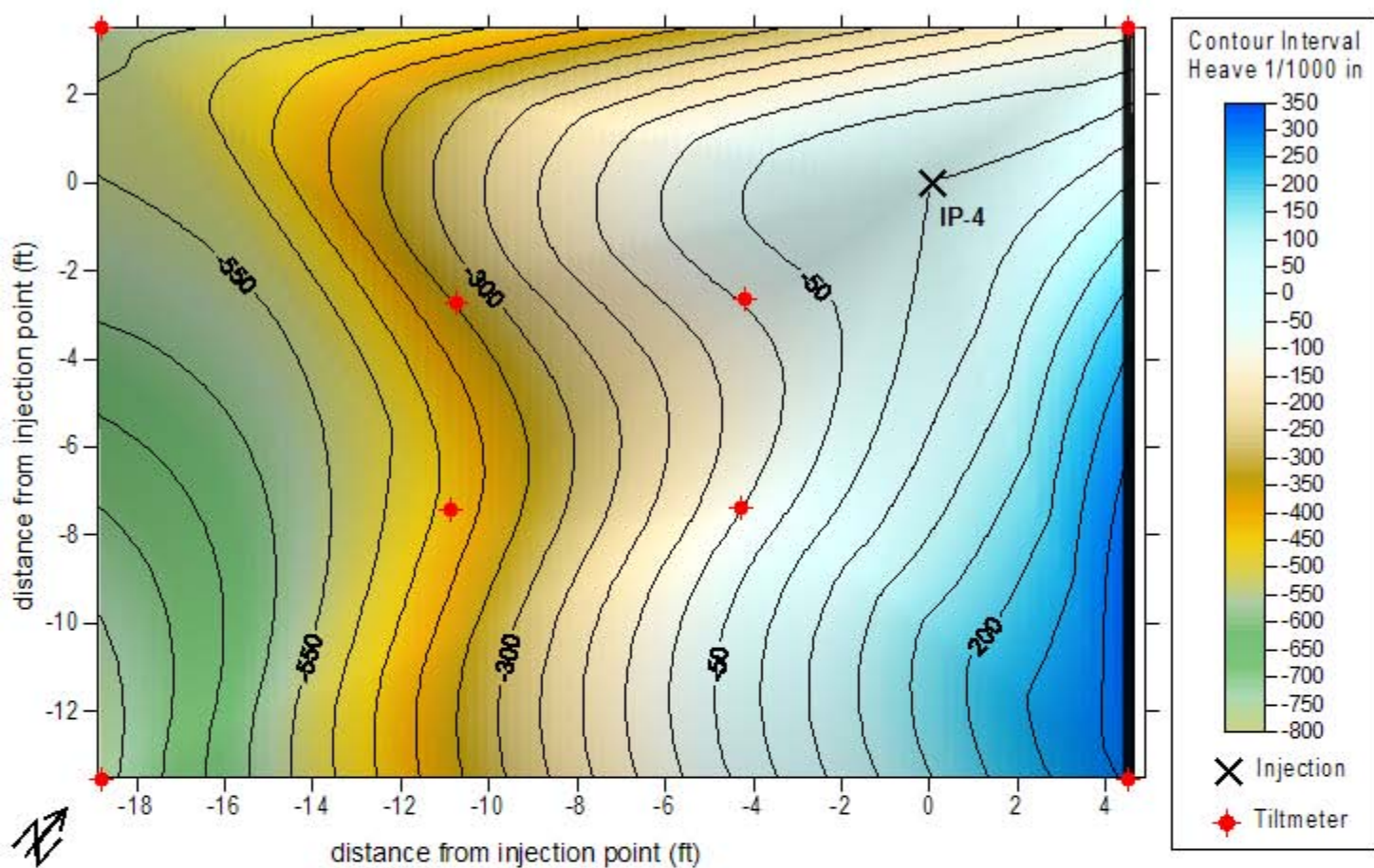
Tiltmeter Contour Map IP-1 and IP 3



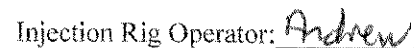
Tiltmeter Contour Map IP 2



Tiltmeter Contour Map IP 4



VIRONEX DAILY INJECTION FIELD LOG SHEET



Inject EZVI into 3 injection locations, targeting a treatment zone from 6-12' bgs. Conduct soil sampling from 6 locations within the treatment zone. Install 5 injection points to 18' bgs for Pneumatic Fracturing & Collect 6 soil samples, 3 from 6-12' bgs & 3 from 4-18' bgs.

[illegible]

APPENDIX G

DATA VALIDATION SUMMARY

LIST OF TABLES

Table G-1:	Groundwater VOC RPD Summary
Table G-2:	Soil VOC RPD Summary
Table G-3:	Groundwater DHG RPD Summary
Table G-4:	Groundwater VFA RPD Summary
Table G-5:	Groundwater VOC MS/MSD Recovery

A summary of the data quality evaluation findings is provided below. Data validation summary tables are presented in Tables G-1 through G-5. Completed data validation checklists are presented in Attachment 1. All data for VOC, DHG, and VFA samples was validated using USEPA data qualifiers for organic and inorganic data (540/R-99/008 [USEPA, 1999] and 540-R-04-004 [USEPA, 2004]). Data for samples collected by the USEPA (anions, alkalinity, TOC, cations, dissolved metals) was not validated as the data was deemed validated by USEPA.

March 2009 Groundwater Sampling

Field Duplicates – For ML 5-3, the sample and field duplicate had detections for ethane of 0.52 mg/L and 0.36 mg/L, respectively. For ML 5-3, the sample and field duplicate had detections for methane of 5.6 mg/L and 3.7 mg/L, respectively. For ML 5-3, the sample and field duplicate had detections for ethene of 29 mg/L and 20 mg/L, respectively. All other field duplicates had relative percent difference (RPD) values meeting Geosyntec’s project QA precision goal of 20%.

MS/MSD Samples – For the MS/MSD analysis of sample ML1-4, percent recovery of cDCE in the MSD was below acceptable limits. However, the percent recovery of cDCE in the corresponding MS and laboratory control sample (LCS) were within Geosyntec’s QA accuracy limits and laboratory QC limits. In the same sample analysis percent recoveries of VC were below acceptable limits in MS and MSD. However, the percent recovery of the corresponding LCS was within laboratory QC limits. For MS/MSD analysis of sample ML3-5, percent recovery of PCE in the MSD was above acceptable limits. However, the percent recovery of PCE in the corresponding MS and LCS were within Geosyntec’s QA accuracy limits and laboratory QC limits. As such, no action was deemed necessary. All other spike recoveries for the six VOC analytes were within Geosyntec’s QA accuracy limits.

Sample Holding Times – Holding time exceeded 14 days for acetylene analysis of sample ML7-7 in order to obtain the lowest possible detection limit.

Laboratory Surrogates – Recovery of toluene-d8 for PMW-6 was below the laboratory QC limit. As such, detected VOC concentrations for that sample were qualified with a “J” as estimated. This resulted in the application of a “J” qualifier to the TCE, cDCE, tDCE and VC concentrations for that sample. All other surrogate recoveries were within laboratory control limits.

Other – Cooler temperature was greater than 4 °C for groundwater samples sent under submission R0901473 (ML3-2, ML8-1, ML3-3, ML3-4, ML3-5, ML3-6, and ML3-7).

March 2009 Soil Sampling

Field Duplicates – For SC-11 (12-14), the sample and field duplicate had detections for cDCE of 420 µg/kg and 710 µg/kg, respectively. For SC-13 (12-14), the sample and field duplicate had detections for PCE of 580 µg/kg and 1,900 µg/kg, respectively. For SC-13 (12-14), the sample and field duplicate had detections for cDCE of 18,000 µg/kg

and 23,000 µg/kg, respectively. All other field duplicates had RPD values meeting Geosyntec's project QA precision goal of 20%.

Other – Due to difficult sample matrix, the laboratory reporting limits (RLs) for VOCs were above the required quantitation limit (QL) developed for this demonstration.

July 2008 Groundwater Sampling

Field Duplicates – For PMW-3, the sample and field duplicate had detections for ethane of 0.77 mg/L and 0.54 mg/L, respectively. For PMW-3, the sample and field duplicate had detections for methane of 9 mg/L and 6.4 mg/L, respectively. All other field duplicates had RPD values meeting Geosyntec's project QA precision goal of 20%.

MS/MSD Samples – For one MS/MSD sample analysis, percent recovery of 1,1-DCE in the MS and MSD was below acceptable limits. However, the percent recovery of 1,1-DCE in the corresponding LCS was within laboratory QC limits. In the same MS/MSD sample analysis, 1,1-DCE and trans-1,2-DCE percent recoveries in the MS were above acceptable limits. However, the percent recovery of 1,1-DCE and trans-1,2-DCE in the MSD and corresponding LCS was within Geosyntec's QA accuracy limits and laboratory QC limits, respectively. For another MS/MSD sample analysis, percent recovery of vinyl chloride in the MS and MSD was below acceptable limits. However, the percent recovery of vinyl chloride in the corresponding LCS was within laboratory QC limits. As such, no action was deemed necessary. All other spike recoveries for the six VOC analytes were within Geosyntec's QA accuracy limits.

Other – All laboratory method blanks for DHG analyses contained low levels of methane above the method detection/reporting limit but below the quantitation limit ("J"-qualified). Because these levels were below the quantitation limit no action was deemed necessary.

January 2008 Groundwater Sampling

Field Duplicates – For PMW-6, the sample and field duplicate had detections for tDCE of 82 µg/L and 62 µg/L, respectively. For ML-5-3, the sample and field duplicate had detections for acetic acid of 120 mg/L and 76 mg/L, respectively. For ML-5-3, the sample had a detection for butyric acid of 6 mg/L, while the duplicate had a non-detect for butyric acid (<2 mg/L). For ML-5-3, the sample and field duplicate had detections for propionic acid of 16 mg/L and 3.4 mg/L, respectively. All other field duplicates had RPD values meeting Geosyntec's project QA precision goal of 20%.

MS/MSD Samples – For one MS/MSD sample analysis, 1,1-DCE percent recovery in the MS was above acceptable limits. The percent recovery of 1,1-DCE in the corresponding LCS was also at the upper laboratory QC limit. However, all samples analyzed on the same analytical run had a non-detect for 1,1-DCE. As such, no action was deemed necessary. For a second MS/MSD sample analysis, cDCE percent recovery in the MS was below acceptable limits. However, the percent recovery of cDCE in the MSD and corresponding LCS was within Geosyntec's QA accuracy limits and laboratory QC

limits, respectively. As such, no action was deemed necessary. All other spike recoveries for the six VOC analytes were within Geosyntec's QA accuracy limits.

Trip Blanks – One trip blank had a trace detection of PCE (0.29 J µg/L). To prevent the inclusion of non-site-related detections in the data set, samples in which concentrations of PCE were below the QL and less than five times the amount detected in the trip blank were reported at the QL and qualified by Geosyntec as non-detected (i.e., applied a “U”-qualifier). For samples in which concentrations of PCE were above the quantitation limit but were less than five times the amount detected in the trip blank, PCE concentrations were qualified by Geosyntec with a “U”. This resulted in application of a “U”-qualifier to the PCE concentration for ML-3-4. All other trip blanks were non-detect for the six VOC analytes.

July 2007 Groundwater Sampling

Field Duplicates – For PMW-3, the sample and field duplicate had detections for PCE of 1,200 µg/L and 2,100 µg/L, respectively. For PMW-3, the sample and field duplicate had detections for TCE of 1,800 µg/L and 3,000 µg/L, respectively. For PMW-3, the sample had a detection for tDCE of 250 µg/L, while the duplicate had a trace detection of tDCE (200 J µg/L). For PMW-3, the sample and field duplicate had detections for VC of 3,200 µg/L and 2,500 µg/L, respectively. For PMW-3, the sample and field duplicate had detections for ethene of 260 mg/L and 330 mg/L, respectively. For PMW-3, the sample and field duplicate had detections for methane of 1,000 mg/L and 1,300 mg/L, respectively. All other field duplicates had RPD values meeting Geosyntec's project QA precision goal of 20%.

Trip Blanks – One trip blank had a detection for PCE of 1 µg/L. To prevent the inclusion of non-site-related detections in the data set, samples in which concentrations of PCE were below the QL and less than five times the amount detected in the trip blank were reported at the QL and qualified by Geosyntec as non-detected (i.e., applied a “U”-qualifier). For samples in which concentrations of PCE were above the quantitation limit but were less than five times the amount detected in the trip blank, PCE concentrations were qualified by Geosyntec with a “U”. This resulted in application of a “U”-qualifier to the PCE concentrations for ML-3-4, ML-3-5 and ML-3-6. A second trip blank had trace detections of PCE (0.5 J µg/L) and cDCE (0.3 J µg/L). To prevent the inclusion of non-site-related detections in the data set, samples in which concentrations of PCE or cDCE were below the QL and less than five times the amount detected in the trip blank were reported at the QL and qualified by Geosyntec as non-detected (i.e., applied a “U”-qualifier). For samples in which concentrations of PCE or cDCE were above the quantitation limit but were less than five times the amount detected in the trip blank, PCE or cDCE concentrations were qualified by Geosyntec with a “U”. This resulted in application of a “U”-qualifier to zero site sample. All other trip blanks were non-detect for the six VOC analytes.

March 2007 Groundwater Sampling

Field Duplicates – For ML-6-5, the sample and field duplicate had detections for tDCE of 430 µg/L and 350 µg/L, respectively. For PMW-5, the sample and field duplicate had detections for acetylene of 0.039 mg/L and 0.031 mg/L, respectively. For ML-6-5, the sample and field duplicate had detections for acetylene of 0.015 mg/L and 0.012 mg/L, respectively. All other field duplicates had RPD values meeting Geosyntec's project QA precision goal of 20%.

MS/MSD Samples – For one MS/MSD sample analysis, 1,1-DCE percent recovery in the MSD was above acceptable limits. However, the percent recovery of cDCE in the MS and corresponding LCS was within Geosyntec's QA accuracy limits and laboratory QC limits, respectively. As such, no action was deemed necessary. All other spike recoveries for the six VOC analytes were within Geosyntec's QA accuracy limits.

January 2007 Groundwater Sampling

Field Duplicates – For ML-5-4, the sample and field duplicate had detections for methane of 5.3 mg/L and 3.9 mg/L, respectively. All other field duplicates had RPD values meeting Geosyntec's project QA precision goal of 20%.

MS/MSD Samples – The VOCs listed for one of the MS/MSD sample analyses were not project-specific VOCs. The laboratory corrected this and issued a revised MS/MSD form for project-specific VOCs.

Laboratory Surrogates – Recovery of dibromofluoromethane for ML-2-5 (10,000 dilution sample) was below the laboratory QC limit. As such, detected VOC concentrations for that sample were qualified with a "J" as estimated. This resulted in the application of a "J" qualifier to the PCE, TCE and cDCE concentrations for that sample. All other surrogate recoveries were within laboratory control limits.

Sample Holding Times - Sample ML-3-2 arrived at the laboratory with a pH>2 and was analyzed after 7 days. As such, detected VOC concentrations for that sample were qualified with a "J" as estimated. This resulted in the application of a "J" qualifier to all VOC concentrations for that sample except for 1,1-DCE. All other samples were analyzed within their recommended holding time.

Other – The case narrative for one of the laboratory reports references a sample that was not present in that sample submission. The laboratory corrected this and issued a revised case narrative.

November 2006 Groundwater Sampling

Field Duplicates - For PMW-5, the sample and field duplicate had detections for PCE of 32,000 µg/L and 40,000 µg/L, respectively. For PMW-5, the sample and field duplicate had detections for cDCE of 47,000 µg/L and 58,000 µg/L, respectively. For ML-5-5, the

sample and field duplicate had detections for butyric acid of 6.2 mg/L and 8.2 mg/L, respectively. All other field duplicates had RPD values meeting Geosyntec's project QA precision goal of 20%.

MS/MSD Samples – For one MS/MSD sample analysis, PCE and TCE percent recoveries in both the MS and MSD were below acceptable limits. The percent recovery of TCE in the corresponding LCS was also below Geosyntec's QA accuracy limits. However, the percent recovery of PCE in the corresponding LCS was within Geosyntec's QA accuracy limits. As such, TCE concentrations for samples on the same analytical run as the MS/MSD were qualified with a "J" as estimated. This resulted in the application of a "J" qualifier to TCE concentrations for ML-3-5, ML-3-7, ML-7-5, PMW-5 (sample and field duplicate) and PMW-6. For another MS/MSD sample analysis, PCE percent recoveries in both the MS and MSD and cDCE percent recovery in the MS were below acceptable limits. However, the percent recoveries of PCE and cDCE in the corresponding LCS were within Geosyntec's QA accuracy limits. As such, no action was deemed necessary. All other spike recoveries for the six VOC analytes were within Geosyntec's QA accuracy limits.

Trip Blanks – A trip blank was omitted from one of the sample submissions. Field sampling protocols were reviewed by QA/QC Officer and inclusion of a trip blank with each sample submission was verified through review of laboratory acknowledgement of sample receipt letters for subsequent sampling events.

Other – The sample dates on listed in the EDDs did not match the sample dates listed on the chain of custody. As such, the sample dates in the database were updated to match those listed on the chain of custody.

October 2006 Groundwater Sampling

Field Duplicates - For ML-6-5, the sample and field duplicate had detections for PCE of 39,000 µg/L and 48,000 µg/L, respectively. For PMW-3, the sample and field duplicate had detections for PCE of 22,000 µg/L and 33,000 µg/L, respectively. For PMW-3, the sample and field duplicate had detections for cDCE of 27,000 µg/L and 21,000 µg/L, respectively. For ML-6-5, the sample and field duplicate had detections for ethene of 0.0012 mg/L and 0.0017 mg/L, respectively. All other field duplicates had RPD values meeting Geosyntec's project QA precision goal of 20%.

MS/MSD Samples – For one MS/MSD sample analysis, PCE and cDCE percent recoveries in both the MS and MSD were below acceptable limits. For the same sample analysis, TCE percent recovery in the MSD was also below acceptable limits. However, the percent recoveries of PCE, TCE and cDCE in the corresponding LCS were within Geosyntec's QA accuracy limits. As such, no action was deemed necessary. All other spike recoveries for the six VOC analytes were within Geosyntec's QA accuracy limits.

Other – For one laboratory submission, several VOC and DHG sample vials were reported as being either totally or partially frozen upon arrival at the lab. Sample

handling procedures were reviewed as necessary to avoid similar issues for subsequent sampling events.

August 2006 Groundwater Sampling

MS/MSD Samples – MS/MSD samples were not collected during this event. As a result sampling protocols were reviewed to avoid this from occurring during subsequent sampling events.

June 2006 Groundwater Sampling

Field Duplicates – Field duplicate samples were not collected during this event. As a result sampling protocols were reviewed to avoid this from occurring during subsequent sampling events.

Other – The laboratory RL for lactic acid (10 mg/L) was below the required QL developed for this demonstration. However, because the laboratory method detection limit (MDL) did not exceed the desired QL, and no samples yielded hits for lactic acid between the lab RL and MDL (i.e., “J”-flagged”), no action was deemed necessary.

June 2006 Soil Sampling

Field Duplicates – Field duplicate samples were not collected for f_{oc} and porosity during this event. However because these samples were only being collected during this one event, no action was deemed necessary.

Other – The laboratory RLs for f_{oc} were above the required QL developed for this demonstration. However, because all soil f_{oc} results were above the RLs, no action was deemed necessary. Due to difficult sample matrix, the laboratory RLs for VOCs were above the required QL developed for this demonstration.

June 2005 Groundwater Sampling

June 2005 groundwater data was not validated as is was not used as part of the technology performance assessment.

June 2005 Soil Sampling

Laboratory Surrogates – Recovery of bromofluorobenzene for SC-2-8 was above the laboratory QC limit. However, because all VOCs were below the laboratory RL for this sample, no action was deemed necessary. All other surrogate recoveries were within laboratory control limits.

Other – Temperatures for moisture (15°C) and methanol (8°C) blanks were greater than 6°C for all blanks). As such sample shipping protocols were adjusted to avoid elevated

sample temperatures during future sampling events. Due to difficult sample matrix, the laboratory RLs for VOCs were above the required QL developed for this demonstration.

References

USEPA. 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. EPA540/R-99/008. October 1999.

USEPA. 2004. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. EPA 540-R-04-004. October 2004.

TABLE G-1: GROUNDWATER VOC RPD SUMMARY
Parris Island, South Carolina

Geosyntec Consultants

Sample Event	Location	Date Sampled	Duplicate	PCE (µg/L)	TCE (µg/L)	cDCE (µg/L)	tDCE (µg/L)	1,1-DCE (µg/L)	VC (µg/L)
Aug-06	ML-5-6	23-Aug-06	--	50 U	50 U	11,000	120	50 U	110
	ML-5-6	23-Aug-06	Duplicate	100 U	100 U	12,000	120	100 U	100
			RPD (%)	N/A	N/A	-8.7	0.0	N/A	9.5
	PMW-5	21-Aug-06	--	76,000	21,000	19,000	500 U	500 U	500 U
	PMW-5	21-Aug-06	Duplicate	78,000	22,000	20,000	500 U	500 U	500 U
			RPD (%)	-2.6	-4.7	-5.1	0.0	0.0	0.0
Oct-06	ML-6-5	05-Oct-06	--	39,000	6,900	15,000	250 U	250 U	250 U
	ML-6-5	05-Oct-06	Field Duplicate	48,000	8,400	16,000	200 U	200 U	200 U
			RPD (%)	-20.7	-19.6	-6.5	N/A	N/A	N/A
	PMW-3	10-Oct-06	--	22,000	5,700	27,000	800	250 U	1,200
	PMW-3	10-Oct-06	Field Duplicate	33,000	6,800	21,000	660	200 U	990
			RPD (%)	-40.0	-17.6	25.0	19.2	N/A	19.2
Nov-06	ML-5-5	29-Nov-06	--	7,600	3,800	21,000	200	200 U	1,000
	ML-5-5	29-Nov-06	Field Duplicate	7,300	3,600	21,000	220	100 U	1,200
			RPD (%)	4.0	5.4	0.0	-9.5	N/A	-18.2
	PMW-5	02-Dec-06	--	32,000	17,000	47,000	250 U	250 U	250 U
	PMW-5	02-Dec-06	Field Duplicate	40,000	20,000	58,000	500 U	500 U	500 U
			RPD (%)	-22.2	-16.2	-21.0	N/A	N/A	N/A
Jan-07	ML-5-4	23-Jan-07	--	100 U	130	16,000	180	100 U	2,800
	ML-5-4	23-Jan-07	Duplicate	100 U	150	16,000	180	100 U	2,700
			RPD (%)	0.0	-14.3	0.0	0.0	0.0	3.6
	PMW-6	19-Jan-07	--	2,300	1,000	4,300	130	40 U	3,000
	PMW-6	19-Jan-07	Duplicate	2,300	1,000	4,200	110	40 U	3,000
			RPD (%)	0.0	0.0	2.4	16.7	0.0	0.0
Mar-07	PMW-5	21-Mar-07	--	32,000	18,000	56,000	280	500 U	170
	PMW-5	21-Mar-07	Duplicate	33,000	18,000	65,000	270	200 U	190
			RPD (%)	-3.1	0.0	-14.9	3.6	N/A	-11.1
	ML-6-5	27-Mar-07	--	400 U	3,400	73,000	430	400 U	10,000
	ML-6-5	26-Mar-07	Duplicate	200 U	3,700	77,000	350	200 U	8,400
			RPD (%)	N/A	-8.5	-5.3	20.5	N/A	17.4
Jul-07	PMW-3	11-Jul-07	--	1,200	1,800	25,000	250	200 U	3200
	PMW-3	11-Jul-07	Duplicate	2,100	3,000	22,000	200 J	200 U	2500
			RPD (%)	-54.5	-50.0	12.8	22.2	0.0	24.6
	ML-4-5	16-Jul-07	--	20 U	20 U	810	22	20 U	3,300
	ML-4-5	16-Jul-07	Duplicate	20 U	20 U	890	19	20 U	3,800
			RPD (%)	0.0	0.0	-9.4	14.6	0.0	-14.1
Jan-08	PMW-3	16-Jan-08	--	520	510	38,000	240	48 J	4,200
	PMW-3	16-Jan-08	Duplicate	450	470	39,000	230	50 J	4,200
			RPD (%)	14.4	8.2	-2.6	4.3	-4.1	0.0
	PMW-6	17-Jan-08	--	51	170	860	82	2.0 J	780
	PMW-6	17-Jan-08	Duplicate	55	180	800	62	1.9 J	720
			RPD (%)	-7.5	-5.7	7.2	27.8	5.1	8.0
	ML-6-4	23-Jan-08	--	200 U	440	57,000	350	82 J	13,000
Jul-08	ML-6-4	23-Jan-08	Duplicate	500 U	360 J	54,000	320 J	500 U	13,000
			RPD (%)	N/A	20.0	5.4	9.0	N/A	0.0
	PMW-3	16-Jul-08	--	720	1,100	8,800	100	50 U	2200
	PMW-3	16-Jul-08	Duplicate	740	1,200	8,900	110	12 J	2600
			RPD (%)	-2.7	-8.7	-1.1	-9.5	N/A	-16.7
Mar-09	ML-2-4	21-Jul-08	--	500 U	1000	72,000	420 J	500 U	32,000
	ML-2-4	21-Jul-08	Duplicate	500 U	1100	77,000	440 J	500 U	34,000
			RPD (%)	N/A	-9.5	-6.7	-4.7	N/A	-6.1
	PMW-1	04-Mar-09	--	76	86	1,800	36	10 U	780
	PMW-1	04-Mar-09	Duplicate	68	81	1,600	36	10 U	660
			RPD (%)	11.1	6.0	11.8	0.0	N/A	16.7
	PMW-5	05-Mar-09	--	33000	18000	81,000	500 U	500 U	4,200
Mar-09	PMW-5	05-Mar-09	Duplicate	35000	18000	89,000	500 U	500 U	4,600
			RPD (%)	N/A	0.0	-9.4	0.0	N/A	-9.1
	ML-5-3	06-Mar-09	--	200 U	200 U	4,200	720	200 U	15,000
	ML-5-3	06-Mar-09	Duplicate	100 U	100 U	3,700	700	100 U	17,000
			RPD (%)	N/A	N/A	12.7	2.8	N/A	-12.5

Notes:

µg/L - micrograms per liter

"U" - not detected (reported at detection limit)

"J" - estimated result

N/A - not applicable

RPD - relative percent difference

TABLE G-2: SOIL VOC RPD SUMMARY
Parris Island, South Carolina

Geosyntec Consultants

Sample Event	Location	Sample Depth (ft)	Date Sampled	Duplicate	PCE (µg/kg)	TCE (µg/kg)	cDCE (µg/kg)	tDCE (µg/kg)	1,1-DCE (µg/kg)	VC (µg/kg)
Jun-05	SC-1	6-8	13-Jun-05	--	140,000	4,200	2,400 U	2,400 U	2,400 U	4,800 U
	SC-1	6-8	13-Jun-05	Duplicate	130,000	3,900	2,400 U	2,400 U	2,400 U	4,800 U
				RPD (%)	7.4	7.4	N/A	N/A	N/A	N/A
	SC-2	18-20	13-Jun-05	--	670 U	670 U	670 U	670 U	670 U	1,300 U
	SC-2	18-20	13-Jun-05	Duplicate	670 U	670 U	670 U	670 U	670 U	1,300 U
				RPD (%)	N/A	N/A	N/A	N/A	N/A	N/A
	SC-3	16-18	13-Jun-05	--	1,300	560 U	560 U	560 U	560 U	1,100 U
	SC-3	16-18	13-Jun-05	Duplicate	1,100	560 U	560 U	560 U	560 U	1,100 U
				RPD (%)	16.7	N/A	N/A	N/A	N/A	N/A
	SC-4	10-12	13-Jun-05	--	8,800	2,500	1,100	330 U	330 U	660 U
	SC-4	10-12	13-Jun-05	Duplicate	7,500	2,200	1,000	330 U	330 U	660 U
				RPD (%)	16.0	12.8	9.5	N/A	N/A	N/A
Jun-06	SC-9	14-16	21-Jun-06	--	330 U	330 U	330 U	330 U	330 U	660 U
	SC-9	14-16	21-Jun-06	Field Duplicate	340 U	340 U	340 U	340 U	340 U	670 U
				RPD (%)	N/A	N/A	N/A	N/A	N/A	N/A
Mar-09	SC-11	12-14	17-Mar-09	--	320 U	320 U	420	320 U	320 U	650 U
	SC-11	12-14	17-Mar-09	Field Duplicate	320 U	320 U	710	320 U	320 U	650 U
				RPD (%)	N/A	N/A	-51.3	N/A	N/A	N/A
	SC-13	12-14	17-Mar-09	--	580	320 U	18,000	320 U	320 U	650 U
	SC-13	12-14	17-Mar-09	Field Duplicate	1,900	320 U	23,000	320 U	320 U	640 U
				RPD (%)	-106.5	N/A	-24.4	N/A	N/A	N/A

Notes:

µg/L - micrograms per liter
 "U" - not detected (reported at detection limit)
 "J" - estimated result
 N/A - not applicable
 RPD - relative percent difference

TABLE G-3: GROUNDWATER DHG RPD SUMMARY
Parris Island, South Carolina

Geosyntec Consultants

Sample Event	Location	Date Sampled	Duplicate	Acetylene (mg/L)	Ethane (mg/L)	Ethene (mg/L)	Methane (mg/L)
Aug-06	ML-5-6	23-Aug-06	--	--	0.005 U	0.0078	0.26
	ML-5-6	23-Aug-06	Duplicate	--	0.005 U	0.0075	0.24
			RPD (%)	N/A	0.0	3.9	8.0
	PMW-5	21-Aug-06	--	--	0.0023	0.0062	0.12
	PMW-5	21-Aug-06	Duplicate	--	0.0021	0.0057	0.1
			RPD (%)	N/A	9.1	8.4	18.2
Oct-06	ML-6-5	05-Oct-06	--	0.003 U	0.001 U	0.0012	0.085
	ML-6-5	05-Oct-06	Field Duplicate	0.003 U	0.001 U	0.0017	0.082
			RPD (%)	0.0	0.0	-34.5	3.6
	PMW-3	10-Oct-06	--	0.003 U	0.0014	0.11	0.44
	PMW-3	10-Oct-06	Field Duplicate	0.003 U	0.0015	0.11	0.44
			RPD (%)	0.0	-6.9	0.0	0.0
Nov-06	ML-5-5	29-Nov-06	--	0.003 U	0.010	0.053	0.34
	ML-5-5	29-Nov-06	Field Duplicate	0.003 U	0.010	0.055	0.30
			RPD (%)	0.0	0.0	-3.7	12.5
	PMW-5	02-Dec-06	--	0.11 J	0.14	0.54	0.056
	PMW-5	02-Dec-06	Field Duplicate	0.1 J	0.15	0.55	0.053
			RPD (%)	9.5	-6.9	-1.8	5.5
Jan-07	ML-5-4	23-Jan-07	--	0.003 U	0.072	0.28	5.3
	ML-5-4	23-Jan-07	Duplicate	0.003 U	0.068	0.26	3.9
			RPD (%)	0.0	5.7	7.4	30.4
	PMW-6	19-Jan-07	--	0.003 U	0.021	0.23	0.37
	PMW-6	19-Jan-07	Duplicate	0.003 U	0.020	0.22	0.34
			RPD (%)	0.0	4.9	4.4	8.5
Mar-07	PMW-5	21-Mar-07	--	0.039	0.65	2.3	0.43
	PMW-5	21-Mar-07	Duplicate	0.031	0.58	2	0.4
			RPD (%)	22.9	11.4	14.0	7.2
	ML-6-5	27-Mar-07	--	0.015	0.5	1.8	0.15
	ML-6-5	26-Mar-07	Duplicate	0.012	0.46	1.6	0.14
			RPD (%)	22.2	8.3	11.8	6.9
Jul-07	PMW-3	11-Jul-07	--	0.003 U	0.057	260	1000
	PMW-3	11-Jul-07	Duplicate	0.003 U	0.057	330	1300
			RPD (%)	0.0	0.0	-23.7	-26.1
	ML-4-5	16-Jul-07	--	0.003 U	0.0043	1.4	5.4
	ML-4-5	16-Jul-07	Duplicate	0.003 U	0.0051	1.4	5.2
			RPD (%)	0.0	-17.0	0.0	3.8
Jan-08	PMW-3	16-Jan-08	--	0.003 U	0.55	1.9	6.7
	PMW-3	16-Jan-08	Duplicate	0.003 U	0.52	1.8	6.4
			RPD (%)	0.0	5.6	5.4	4.6
	PMW-6	17-Jan-08	--	0.003 U	0.0052	0.51	5.3
	PMW-6	17-Jan-08	Duplicate	0.003 U	0.0047	0.61	5.9
			RPD (%)	0.0	10.1	-17.9	-10.7
	ML-6-4	23-Jan-08	--	0.003 U	1	4.4	1.4
	ML-6-4	23-Jan-08	Duplicate	0.003 U	1	4.5	1.3
Jul-08			RPD (%)	0.0	0.0	-2.2	7.4
	PMW-3	16-Jul-08	--	0.003 U	0.084	0.77	9
	PMW-3	16-Jul-08	Duplicate	0.003 U	0.09	0.54	6.4
			RPD (%)	0.0	-6.9	35.1	33.8
	ML-2-4	21-Jul-08	--	0.003 U	0.72	5.5	0.62
	ML-2-4	21-Jul-08	Duplicate	0.003 U	0.67	4.8	0.54
Mar-09			RPD (%)	0.0	7.2	13.6	13.8
	PMW-5	05-Mar-09	--	0.1 U	0.83	3.1	1.6
	PMW-5	05-Mar-09	Duplicate	0.1 U	0.82	2.8	1.5
			RPD (%)	0.0	1.2	10.2	6.5
	PMW-1	04-Mar-09	--	0.2 U	0.1 U	0.41	9.2
	PMW-1	04-Mar-09	Duplicate	0.2 U	0.1 U	0.43	8.6
			RPD (%)	0.0	0.0	-4.8	6.7
	ML-5-3	06-Mar-09	--	1 U	0.52	29	5.6
	ML-5-3	06-Mar-09	Duplicate	0.5 U	0.36	20	3.7
			RPD (%)	N/A	36.4	36.7	40.9

Notes:

mg/L - milligrams per liter
 "U" - not detected (reported at detection limit)
 "J" - estimated result
 N/A - not applicable
 RPD - relative percent difference

TABLE G-4: GROUNDWATER VFA RPD SUMMARY
Parris Island, South Carolina

Geosyntec Consultants

Sample Event	Location	Date Sampled	Duplicate	Acetic Acid (mg/L)	Butyric Acid (mg/L)	Lactic Acid (mg/L)	Propionic Acid (mg/L)	Pyruvic Acid (mg/L)
Nov-06	ML-5-5	29-Nov-06	--	65	6.2	1 U	110	0.5 U
	ML-5-5	29-Nov-06	Field Duplicate	66	8.2	1 U	110	0.5 U
	RPD (%)			-1.5	-27.8	0.0	0.0	0.0
Jan-06	ML-7-7	25-Jan-07	--	89	9.1	1 U	130	0.5 U
	ML-7-7	25-Jan-07	Duplicate	94	11	1 U	140	0.5 U
	RPD (%)			-5.5	-18.9	0.0	-7.4	0.0
Mar-07	PMW-5	21-Mar-07	--	100	33	10 U	160	5 U
	PMW-5	21-Mar-07	Duplicate	100	36	1.0 U	160	0.50 U
	RPD (%)			0.0	-8.7	N/A	0.0	N/A
	ML-6-5	27-Mar-07	--	62	6.3	1.0 U	79	0.50 U
	ML-6-5	26-Mar-07	Duplicate	62	6.2	1.0 U	78	0.50 U
RPD (%)				0.0	1.6	0.0	1.3	0.0
Jan-08	PMW-6	17-Jan-08	--	12	2 U	1 U	1.4	0.5 U
	PMW-6	17-Jan-08	Duplicate	12	2 U	1 U	1.4	0.5 U
	RPD (%)			0.0	0.0	0.0	0.0	0.0
	ML-5-3	22-Jan-08	--	120	6	1 U	16	0.5 U
	ML-5-3	22-Jan-08	Duplicate	76	2 U	1 U	3.4	0.5 U
RPD (%)				44.9	100.0	0.0	129.9	0.0
Mar-09	PMW-5	05-Mar-09	--	100	30	1 U	71	0.5 U
	PMW-5	05-Mar-09	Duplicate	100	30	1 U	72	0.5 U
	RPD (%)			0.0	0.0	N/A	-1.4	N/A
	ML-5-3	06-Mar-09	--	170	5.1	1 U	24	0.5 U
	ML-5-3	06-Mar-09	Duplicate	170	6.1	1 U	24	0.5 U
RPD (%)				0.0	-17.9	0.0	0.0	0.0

Notes:

mg/L - milligrams per liter
 "U" - not detected (reported at detection limit)
 N/A - not applicable
 RPD - relative percent difference

TABLE G-5: GROUNDWATER VOC MS/MSD RECOVERY SUMMARY
Parris Island, South Carolina

Geosyntec Consultants

Sample Event	Location	MS/MSD	PCE (%R)	TCE (%R)	cDCE (%R)	tDCE (%R)	1,1-DCE (%R)	VC (%R)
Aug-06	--	MS	--	--	--	--	--	--
	--	MSD	--	--	--	--	--	--
		RPD (%)	N/A	N/A	N/A	N/A	N/A	N/A
	--	MS	--	--	--	--	--	--
	--	MSD	--	--	--	--	--	--
		RPD (%)	N/A	N/A	N/A	N/A	N/A	N/A
Oct-06	PMW3-15M	MS	32%	80%	40%	104%	112%	88%
	PMW3-15M	MSD	32%	64%	24%	88%	96%	80%
		RPD (%)	0%	10%	6%	15%	15%	8%
	ML-2-7	MS	112%	104%	96%	100%	104%	100%
	ML-2-7	MSD	112%	108%	88%	100%	108%	96%
		RPD (%)	0%	3%	3%	0%	4%	4%
Nov-06	ML-3-5	MS	66%	76%	80%	101%	94%	110%
	ML-3-5	MSD	72%	76%	100%	83%	82%	90%
		RPD (%)	4%	0%	5%	17%	14%	7%
	PMW-3	MS	60%	88%	76%	96%	112%	97%
	PMW-3	MSD	68%	92%	84%	104%	120%	105%
		RPD (%)	3%	3%	5%	8%	7%	8%
Jan-07	ML-6-6	MS	100%	100%	112%	99%	108%	115%
	ML-6-6	MSD	104%	104%	108%	107%	112%	119%
		RPD (%)	4%	4%	1%	8%	4%	3%
	ML-3-4	MS	99%	96%	104%	94%	108%	104%
	ML-3-4	MSD	103%	92%	100%	98%	112%	104%
		RPD (%)	4%	4%	1%	4%	4%	0%
Mar-07	ML-1-5	MS	96%	100%	104%	114%	116%	104%
	ML-1-5	MSD	104%	108%	104%	118%	124%	104%
		RPD (%)	7%	8%	0%	3%	7%	0%
	ML-7-7	MS	86%	88%	98%	101%	102%	100%
	ML-7-7	MSD	88%	90%	98%	97%	104%	80%
		RPD (%)	2%	2%	0%	4%	2%	6%
Jul-07	ML-2-4	MS	103%	102%	100%	106%	114%	114%
	ML-2-4	MSD	105%	104%	80%	106%	120%	114%
		RPD (%)	2%	2%	6%	0%	5%	0%
	ML-7-6	MS	100%	96%	112%	101%	108%	120%
	ML-7-6	MSD	96%	92%	104%	93%	100%	80%
		RPD (%)	4%	4%	3%	8%	8%	4%
Jan-08	ML-1-7	MS	100%	99%	70%	113%	120%	90%
	ML-1-7	MSD	100%	99%	110%	113%	120%	110%
		RPD (%)	0%	0%	10%	0%	0%	8%
	ML-3-3	MS	105%	106%	113%	111%	128%	116%
	ML-3-3	MSD	87%	90%	101%	99%	110%	106%
		RPD (%)	19%	16%	11%	11%	15%	7%
	ML-4-6	MS	100%	104%	101%	98%	120%	90%
Jul-08	ML-4-6	MSD	100%	94%	101%	98%	120%	90%
		RPD (%)	0%	10%	0%	0%	0%	0%
	PMW-3	MS	83%	88%	24%	124%	124%	116%
	PMW-3	MSD	83%	84%	40%	112%	116%	100%
		RPD (%)	0%	3%	4%	10%	7%	8%
Mar-09	ML-7-6	MS	110%	110%	120%	109%	120%	130%
	ML-7-6	MSD	120%	120%	120%	109%	120%	140%
		RPD (%)	9%	9%	0%	0%	0%	3%
	ML-1-4	MS	104%	98%	73%	96%	92%	66%
	ML-1-4	MSD	109%	101%	68%	94%	94%	59%
		RPD (%)	1%	2%	1%	5%	3%	3%
Mar-09	ML-3-5	MS	120%	108%	102%	97%	97%	100%
	ML-3-5	MSD	122%	111%	101%	98%	98%	98%
		RPD (%)	2%	3%	0%	1%	1%	2%
	ML-6-4	MS	103%	103%	93%	100%	102%	120%
	ML-6-4	MSD	106%	107%	77%	100%	104%	85%
		RPD (%)	4%	4%	5%	1%	2%	14%

Notes:

%R - percent recovery

MS - matrix spike

MSD - matrix spike duplicate

N/A - not applicable

RPD - relative percent difference

ATTACHMENT 1

COMPLETED DATA VALIDATION CHECKLISTS

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: H5F200109	CoC No: -
Completed by: M. Watling	Date: 29-September-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody		X		review/revise handling procedure	Methanol temp blank = 8 degrees C Moisture temp blank = 15 degrees C
Cooler temperature $\leq 6^{\circ}\text{C}$					
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits		X		Lab to complete or correct lab report QA/QC Officer review/revise analytical method	Lab reports elevated reporting limits due to difficult sample matrix.
QLs do not exceed SAP Table B-2, except for diluted samples					
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	N/A				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report: 30-Jun-05	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested: N/A	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: H5F200114	CoC No: -
Completed by: M. Watling	Date: 29-September-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody		X		review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$				review completeness requirement	
Samples arrived intact and without air bubbles	X			Lab to complete or correct CoC	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			review/revise handling procedure	
Samples arrived within 24 hours of shipment	X				
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits		X		Lab to complete or correct lab report QA/QC Officer review/revise analytical method	Lab reports elevated reporting limits due to difficult sample matrix.
QLs do not exceed SAP Table B-2, except for diluted samples				Lab to complete or correct lab report	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
At least 1 method blank was analyzed per sample set?	X				
Samples do not contain detectable VOCs found in method blanks?	N/A				
Surrogate recoveries meet QC acceptance criteria?		X			Surrogate recoveries for SC-2-8 were outside QC limits due to obvious matrix interferences
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	N/A			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A				
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD < or = 20%?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X			Lab to complete or correct lab report	
Completely addresses any lab QC results outside QC limits	X				
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report:	30-Jun-05
Revisions - Date and nature of revisions requested:	MS/MSD - matrix spike/matrix spike duplicate
	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: H5F170338	CoC No: -
Completed by: M. Watling	Date: 29-September-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody		X		review/revise handling procedure	Methanol temp blank = 8 degrees C Moisture temp blank = 15 degrees C
Cooler temperature $\leq 6^{\circ}\text{C}$					
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits		X		Lab to complete or correct lab report QA/QC Officer review/revise analytical method	Lab reports elevated reporting limits due to difficult sample matrix.
QLs do not exceed SAP Table B-2, except for diluted samples					
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	N/A				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	5-Jul-05	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:		%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: H6F220268	CoC No: -
Completed by: M. Watling	Date: 29-September-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits		X		Lab to complete or correct lab report QA/QC Officer review/revise analytical method	Lab reports elevated reporting limits due to difficult sample matrix.
QLs do not exceed SAP Table B-2, except for diluted samples		X		Lab to complete or correct lab report	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	N/A				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $<$ or $\approx 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	5-Jul-06	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:		%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: 680-18113-1	CoC No: -
Completed by: M. Watling	Date: 29-September-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$				review completeness requirement	
Samples arrived intact and without air bubbles	X			Lab to complete or correct CoC	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			review/revise handling procedure	
Samples arrived within 24 hours of shipment	X				
Holding Times	X				
Samples were extracted/digested (if applicable) and analyzed within holding times		X		Lab to complete or correct lab report QA/QC Officer review/revise analytical method	none; lab RL for lactic acid higher than QL in SAP, however lab MDL does not exceed QL in SAP
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X			Lab to complete or correct lab report.	
At least 1 method blank was analyzed per sample set?	X			If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?		X		QA/QC Officer to review/revise sampling protocols	duplicates not collected; sampling protocols reviewed and duplicates samples will be collected for future events
Samples collected as per frequency criteria in SAP?	N/A			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	N/A			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A				
MS/MSD meet QC acceptance criteria?	N/A			review for possible sampling or analysis method revision(s)	
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review/revise handling procedures if necessary	
Trip blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Equipment blanks are ND?	X			Lab to complete or correct lab report	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions	
Date of first lab report:	18-Jul-06
Revisions - Date and nature of revisions requested:	N/A
Revisions Received:	N/A
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Date of receipt of correct and complete lab report:	

QL - quantitation limit (or reporting limit)
 MS/MSD - matrix spike/matrix spike duplicate
 CoC - chain-of-custody
 RPD - relative percent difference
 %R - percent recovery
 N/A - not applicable

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: 680-18060-1	CoC No: -
Completed by: M. Watling	Date: 29-September-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$				review completeness requirement	
Samples arrived intact and without air bubbles	X			Lab to complete or correct CoC	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			review/revise handling procedure	
Samples arrived within 24 hours of shipment	X				
Holding Times	X				
Samples were extracted/digested (if applicable) and analyzed within holding times		X		Lab to complete or correct lab report QA/QC Officer review/revise analytical method	none; lab RL for lactic acid higher than QL in SAP, however lab MDL does not exceed QL in SAP
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X			Lab to complete or correct lab report.	
At least 1 method blank was analyzed per sample set?	X			If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?		X		QA/QC Officer to review/revise sampling protocols	duplicates not collected; sampling protocols reviewed and duplicates samples will be collected for future events
Samples collected as per frequency criteria in SAP?	N/A			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	N/A			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A				
MS/MSD meet QC acceptance criteria?	N/A			review for possible sampling or analysis method revision(s)	
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review/revise handling procedures if necessary	
Trip blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Equipment blanks are ND?	X			Lab to complete or correct lab report	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions	
Date of first lab report:	12-Jul-06
Revisions - Date and nature of revisions requested:	N/A
Revisions Received:	N/A
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Date of receipt of correct and complete lab report:	

QL - quantitation limit (or reporting limit)
 MS/MSD - matrix spike/matrix spike duplicate
 CoC - chain-of-custody
 RPD - relative percent difference
 %R - percent recovery
 N/A - not applicable

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: 680-17908-1	CoC No: -
Completed by: M. Watling	Date: 29-September-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$				review completeness requirement	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were extracted/digested (if applicable) and analyzed within holding times					
Quantitation Limits		X		Lab to complete or correct lab report QA/QC Officer review/revise analytical method	none; lab RL for f_{oc} exceeded QL in SAP for all samples; however all samples had results greater than RL
QLs do not exceed SAP Table B-2, except for diluted samples					
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?		X		QA/QC Officer to review/revise sampling protocols	duplicates not collected for f_{oc} or porosity; sampling protocols reviewed and duplicates samples will be collected for future events
Samples collected as per frequency criteria in SAP?					
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X			Lab to complete or correct lab report	
Completely addresses any lab QC results outside QC limits					
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report					
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	
Date of first lab report:	10-Jul-06
Revisions - Date and nature of revisions requested:	N/A
Revisions Received:	N/A
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Date of receipt of correct and complete lab report:	

QL - quantitation limit (or reporting limit)
 MS/MSD - matrix spike/matrix spike duplicate
 CoC - chain-of-custody
 RPD - relative percent difference
 %R - percent recovery
 N/A - not applicable

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2633276	CoC No: -
Completed by: M. Watling	Date: 29-September-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$				review completeness requirement	
Samples arrived intact and without air bubbles	X			Lab to complete or correct CoC	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			review/revise handling procedure	
Samples arrived within 24 hours of shipment	X				
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	30-Aug-06	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2633276	CoC No: -
Completed by: M. Watling	Date: 29-September-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?		X		QA/QC Officer to review/revise sampling protocols	MS/MSD not collected; sampling protocols reviewed and MS/MSD samples will be added for future events
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report: 30-Aug-06	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested: N/A	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2633277	CoC No: -
Completed by: M. Watling	Date: 29-September-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$				review completeness requirement	
Samples arrived intact and without air bubbles	X			Lab to complete or correct CoC	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			review/revise handling procedure	
Samples arrived within 24 hours of shipment	X				
Holding Times	X				
Samples were extracted/digested (if applicable) and analyzed within holding times					
Quantitation Limits	X			Lab to complete or correct lab report	
QLs do not exceed SAP Table B-2, except for diluted samples				QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X			Lab to complete or correct lab report.	
At least 1 method blank was analyzed per sample set?	X			If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	N/A			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	N/A			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A				
MS/MSD meet QC acceptance criteria?	X			review for possible sampling or analysis method revision(s)	
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review/revise handling procedures if necessary	
Trip blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Equipment blanks are ND?	X			Lab to complete or correct lab report	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	5-Sep-06	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2633277	CoC No: -
Completed by: M. Watling	Date: 29-September-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?		X		QA/QC Officer to review/revise sampling protocols	MS/MSD not collected; sampling protocols reviewed and MS/MSD samples will be added for future events
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report: 5-Sep-06	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested: N/A	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2633904	CoC No: -
Completed by: M. Watling	Date: 4-December-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	checklist shows many vials being partially or totally frozen upon arrival at lab
Samples arrived intact and without air bubbles		X		review completeness requirement	sample handling procedures reviewed as necessary
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issues found
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	26-Oct-06	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2633904	CoC No: -
Completed by: M. Watling	Date: 4-December-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	checklist shows many vials being partially or totally frozen upon arrival at lab; sample handling procedures reviewed as necessary
Cooler temperature $\leq 6^{\circ}\text{C}$					
Samples arrived intact and without air bubbles		X		review completeness requirement	several vials broken upon arrival at lab
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection					
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?					
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?				QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	X				
Field replicates have RPD $< \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issues found
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits				Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report				Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report: 26-Oct-06	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested: N/A	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2633906	CoC No: -
Completed by: M. Watling	Date: 4-December-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X			Lab to complete or correct lab report.	
At least 1 method blank was analyzed per sample set?	X			If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	N/A			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A				
MS/MSD meet QC acceptance criteria?	N/A			review for possible sampling or analysis method revision(s)	
Field replicates have RPD $<$ or $= 20\%$?	N/A			review/revise handling procedures if necessary	
Trip blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Equipment blanks are ND?	X			Lab to complete or correct lab report	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	31-Oct-06	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2633906	CoC No: -
Completed by: M. Watling	Date: 4-December-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issued found
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report: 31-Oct-06	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested: N/A	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	% R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2633908	CoC No: -
Completed by: M. Watling	Date: 4-December-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X			Lab to complete or correct lab report.	
At least 1 method blank was analyzed per sample set?	X			If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	N/A			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A				
MS/MSD meet QC acceptance criteria?	N/A			review for possible sampling or analysis method revision(s)	
Field replicates have $\text{RPD} < \text{or} = 20\%$?	N/A			review/revise handling procedures if necessary	
Trip blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Equipment blanks are ND?	N/A				
Case Narrative	X			Lab to complete or correct lab report	
Completely addresses any lab QC results outside QC limits	X				
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	31-Oct-06	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2633908	CoC No: -
Completed by: M. Watling	Date: 4-December-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?		X			none; %R for PCE, TCE, and cDCE below acceptable limits, but LCS %R's within limits
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report:	31-Oct-06
Revisions - Date and nature of revisions requested:	N/A
	MS/MSD - matrix spike/matrix spike duplicate
	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2634246	CoC No: -
Completed by: M. Watling	Date: 4-December-2006

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X				
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report: 19-Oct-06	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested: N/A	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	% R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2634902	CoC No: -
Completed by: M. Watling	Date: 13-February-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$				review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have $\text{RPD} < \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issues found
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report		X		Resolve which is incorrect and correct	Sample dates in EDD do not match CoC. Dates in database corrected to match CoC

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report:	20-Dec-06
Revisions - Date and nature of revisions requested:	MS/MSD - matrix spike/matrix spike duplicate
	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2634902	CoC No: -
Completed by: M. Watling	Date: 13-February-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?		X			none; PCE %R in MS and MSD and cDCE %R in MS below acceptable limits, but PCE and cDCE %R in LCS within limits
Field replicates have RPD $< \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report		X		Resolve which is incorrect and correct	Sample dates in EDD do not match CoC. Dates in database corrected to match CoC

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report: 20-Dec-06	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested: N/A	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2634988	CoC No: -
Completed by: M. Watling	Date: 13-February-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$				review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have $\text{RPD} < \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report		X		Resolve which is incorrect and correct	Sample dates in EDD do not match CoC. Dates in database corrected to match CoC

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report:	21-Dec-06
Revisions - Date and nature of revisions requested:	MS/MSD - matrix spike/matrix spike duplicate
	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2634988	CoC No: -
Completed by: M. Watling	Date: 13-February-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?		X		QA/QC Officer to review/revise sampling protocols	Trip blank omitted from this submission; will be included in future submissions
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?		X			TCE values "J" flagged for samples in same analytical run as MS/MSD
Field replicates have RPD $< \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issues found
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report		X		Resolve which is incorrect and correct	Sample dates in EDD do not match CoC. Dates in database corrected to match CoC

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report: 21-Dec-06	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested: N/A	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2735772	CoC No: -
Completed by: M. Watling	Date: 22-March-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X			Lab to complete or correct lab report.	
At least 1 method blank was analyzed per sample set?	X			If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	N/A			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A				
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have $\text{RPD} < \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issued found
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X			Lab to complete or correct lab report	
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	13-Feb-07	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2735772	CoC No: -
Completed by: M. Watling	Date: 22-March-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	X				
Field replicates have RPD $< \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report		X		Resolve which is incorrect and correct	Lab report references samples from another submission; CAS issued re-vised case narrative

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report:	13-Feb-07
Revisions - Date and nature of revisions requested:	N/A
Lab report references samples from another submission; CAS issued re-vised case narrative	MS/MSD - matrix spike/matrix spike duplicate
Revisions Received:	20-Mar-07
Revisions - Date and nature of revisions requested:	22-Mar-07
	CoC - chain-of-custody
	RPD - relative percent difference
	%R - percent recovery
	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2735773	CoC No: -
Completed by: M. Watling	Date: 22-March-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			Lab to complete or correct CoC	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			review/revise handling procedure	
Samples arrived within 24 hours of shipment	X				
Holding Times	X				
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X			Lab to complete or correct lab report.	
At least 1 method blank was analyzed per sample set?	X			If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	N/A			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A				
MS/MSD meet QC acceptance criteria?	N/A			review for possible sampling or analysis method revision(s)	
Field replicates have $\text{RPD} < \text{or} = 20\%$?	N/A			review/revise handling procedures if necessary	
Trip blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Equipment blanks are ND?	X			Lab to complete or correct lab report	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report: 8-Feb-07	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested: N/A	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received: N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2735773	CoC No: -
Completed by: M. Watling	Date: 22-March-2007; 3-April-2008

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times		X			samples analyzed within 14day hold time; however, sample ML-3-2 had pH>2 and was analyzed after 7days; VOC data for ML-3-2 flagged as "J"
Samples were analyzed within 14 days of collection					
Quantitation Limits	X			Lab to complete or correct lab report	
QLs do not exceed SAP Table B-2, except for diluted samples	X			QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report.	
Samples do not contain detectable VOCs found in method blanks?	X			If still false, QA/QC Officer to review with lab.	
Surrogate recoveries meet QC acceptance criteria?	X				one surrogate for ML-2-5 was below limit in second diluted sample; VOCs for that sample/dilution flagged as "J"
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples		X		Ignore results if not site or relevant samples	MS/MSD data not for project specific VOCs; lab re-issued MS/MSD data for project specific VOCs on 28-March-08
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	X				
Field replicates have RPD $< \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	8-Feb-07	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	24-Mar-08	CoC - chain-of-custody
provided project specific VOC data for MS/MSD		RPD - relative percent difference
Revisions Received:	28-Mar-08	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:	N/A	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2736709	CoC No: -
Completed by: M. Watling	Date: 27-April-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X			Lab to complete or correct lab report.	
At least 1 method blank was analyzed per sample set?	X			If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	N/A			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A				
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have $\text{RPD} < \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issues found
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X			Lab to complete or correct lab report	
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	19-Apr-07	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2736709	CoC No: -
Completed by: M. Watling	Date: 27-April-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?		X			none; MS %R for 1,1-DCE above acceptable limit, but RPD for MS/MSD 1,1-DCE values within limits and all LCSs have %R for 1,1-DCE within limits
Field replicates have RPD $< \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report: 19-Apr-07	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested: N/A	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received: N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2736853	CoC No: -
Completed by: M. Watling	Date: 27-April-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			Lab to complete or correct CoC	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			review/revise handling procedure	
Samples arrived within 24 hours of shipment	X				
Holding Times	X				
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits	X			Lab to complete or correct lab report	
QLs do not exceed SAP Table B-2, except for diluted samples	X			QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X			Lab to complete or correct lab report.	
At least 1 method blank was analyzed per sample set?	X			If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocol	
Samples collected as per frequency criteria in SAP?	X			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	N/A			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A				
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issues found
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X			Lab to complete or correct lab report	
Completely addresses any lab QC results outside QC limits	X				
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report:	19-Apr-07
Revisions - Date and nature of revisions requested:	MS/MSD - matrix spike/matrix spike duplicate
	CoC - chain-of-custody
Revisions Received:	RPD - relative percent difference
Revisions - Date and nature of revisions requested:	%R - percent recovery
	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2736853	CoC No: -
Completed by: M. Watling	Date: 27-April-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$				review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection					
Quantitation Limits	X			Lab to complete or correct lab report	
QLs do not exceed SAP Table B-2, except for diluted samples				QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?					
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?				QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	X				
Field replicates have RPD $< \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issued found
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits				Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report				Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	19-Apr-07	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2738625	CoC No: -
Completed by: M. Watling	Date: 20-August-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			Lab to complete or correct CoC	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			review/revise handling procedure	
Samples arrived within 24 hours of shipment	X				
Holding Times	X				
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits	X			Lab to complete or correct lab report	
QLs do not exceed SAP Table B-2, except for diluted samples	X			QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X			Lab to complete or correct lab report.	
At least 1 method blank was analyzed per sample set?	X			If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocol	
Samples collected as per frequency criteria in SAP?	X			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	N/A			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A				
MS/MSD meet QC acceptance criteria?	N/A				
		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issues found
Field replicates have RPD \leq or = 20%?	N/A			review/revise handling procedures if necessary	
Trip blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Equipment blanks are ND?	N/A				
Case Narrative	X			Lab to complete or correct lab report	
Completely addresses any lab QC results outside QC limits	X				
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	1-Aug-07	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2738625	CoC No: -
Completed by: M. Watling	Date: 20-August-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits	X			Lab to complete or correct lab report	
QLs do not exceed SAP Table B-2, except for diluted samples	X			QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	X				
Field replicates have RPD $< \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issued found
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	1-Aug-07	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2738636	CoC No: -
Completed by: M. Watling	Date: 20-August-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$				review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have $\text{RPD} < \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	2-Aug-07	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2738636	CoC No: -
Completed by: M. Watling	Date: 20-August-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?		X		review/revise handling procedures if necessary	samples with PCE $< \text{QL}$ and $< 5 \text{ppb}$ reported at QL and "U" flagged; samples with PCE $> \text{QL}$ and $< 5 \text{ppb}$ "U" flagged
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report:	2-Aug-07
Revisions - Date and nature of revisions requested:	MS/MSD - matrix spike/matrix spike duplicate
	CoC - chain-of-custody
Revisions Received:	RPD - relative percent difference
Revisions - Date and nature of revisions requested:	%R - percent recovery
	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2738681	CoC No: -
Completed by: M. Watling	Date: 20-August-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X			Lab to complete or correct lab report.	
At least 1 method blank was analyzed per sample set?	X			If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	N/A			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A				
MS/MSD meet QC acceptance criteria?	N/A			review for possible sampling or analysis method revision(s)	
Field replicates have $\text{RPD} < \text{or} = 20\%$?	N/A			review/revise handling procedures if necessary	
Trip blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Equipment blanks are ND?	N/A				
Case Narrative	X			Lab to complete or correct lab report	
Completely addresses any lab QC results outside QC limits	X				
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report:	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2738681	CoC No: -
Completed by: M. Watling	Date: 20-August-2007

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits	X			Lab to complete or correct lab report	
QLs do not exceed SAP Table B-2, except for diluted samples	X			QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report.	
Samples do not contain detectable VOCs found in method blanks?	X			If still false, QA/QC Officer to review with lab.	
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	X				
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?		X		review/revise handling procedures if necessary	samples with PCE $< 2.5\text{ppb}$ and $< \text{QL}$, data reported at QL and "U" flagged; samples with PCE $< 2.5\text{ppb}$ and $> \text{QL}$, data "U" flagged
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	samples with cDCE $< 1.5\text{ppb}$ and $< \text{QL}$, data reported at QL and "U" flagged; samples with cDCE $< 1.5\text{ppb}$ and $> \text{QL}$, data "U" flagged
Case Narrative	X			Lab to complete or correct lab report	
Completely addresses any lab QC results outside QC limits	X				
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	6-Aug-07	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2841383	CoC No: -
Completed by: M. Watling	Date: 11-March-2008

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X				
Cooler temperature $\leq 6^{\circ}\text{C}$				review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have $\text{RPD} < \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	8-Feb-08	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2841383	CoC No: -
Completed by: M. Watling	Date: 11-March-2008

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?		X			none; RPD for MS/MSD cDCE values within limits and LCS for same run has %R for cDCE within limits
Field replicates have RPD $< \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issued found
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report: 8-Feb-08	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested: N/A	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received: N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2841878	CoC No: -
Completed by: M. Watling	Date: 12-March-2008

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $<$ or $= 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	11-Feb-08	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2841878	CoC No: -
Completed by: M. Watling	Date: 12-March-2008

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			Lab to complete or correct CoC	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			review/revise handling procedure	
Samples arrived within 24 hours of shipment	X				
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	X			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X				
MS/MSD meet QC acceptance criteria?		X			none; samples in same analytical run as MS/MSD were non-detect for 1,1-DCE
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?		X		review/revise handling procedures if necessary	samples with PCE $< 1.45\text{ppb}$ and $< \text{QL}$, data reported at QL and "U" flagged; samples with PCE $< 1.45\text{ppb}$ and $> \text{QL}$, data "U" flagged
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X			Lab to complete or correct lab report	
Completely addresses any lab QC results outside QC limits	X				
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	11-Feb-08	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2841909	CoC No: -
Completed by: M. Watling	Date: 12-March-2008

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X			Lab to complete or correct lab report.	
At least 1 method blank was analyzed per sample set?	X			If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	X				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			Ignore results if not site or relevant samples	
MS/MSD data presented are for site or project relevant samples	N/A			Lab to complete or correct lab report.	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A				
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have $\text{RPD} < \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issued found
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X			Lab to complete or correct lab report	
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X			Lab to complete or correct lab report	
Data qualifiers used in lab report are explained in lab report	X			Resolve which is incorrect and correct	
Electronic data match the lab report	X				

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	13-Feb-08	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2841909	CoC No: -
Completed by: M. Watling	Date: 12-March-2008

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X				
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times	X				
Samples were analyzed within 14 days of collection	X				
Quantitation Limits	X				
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information	X				
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information	X				
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $<$ or $= 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative	X				
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other	X				
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	
Date of first lab report:	13-Feb-08
Revisions - Date and nature of revisions requested:	N/A
Revisions Received:	N/A
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Date of receipt of correct and complete lab report:	

QL - quantitation limit (or reporting limit)
 MS/MSD - matrix spike/matrix spike duplicate
 CoC - chain-of-custody
 RPD - relative percent difference
 %R - percent recovery
 N/A - not applicable

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2845027	CoC No: -
Completed by: M. Watling	Date: 17-Nov-2008

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$				review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information		X			none; methane hit below detection limit (J flagged) for both method blanks
Method blanks are non-detect?				Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
At least 1 method blank was analyzed per sample set?	X				
Samples do not contain detectable analytes found in method blanks?		X			none; samples contain detectable methane, but methane in method blanks hit below detection limit
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have $\text{RPD} < \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issues found
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	6-Aug-08	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2845027	CoC No: -
Completed by: M. Watling	Date: 17-Nov-2008

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles		X		review completeness requirement	none; one trip blank sample had significant bubbles, all other samples OK
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?		X			none; %R for cDCE was below QC limits for both MS and MSD; %R for 1,1-DCE and trans-1,2-DCE was above QC limits for MS
Field replicates have RPD $< \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report: 6-Aug-08	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested: N/A	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received: N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R2845077	CoC No: -
Completed by: M. Watling	Date: 17-Nov-2008

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody	X			review/revise handling procedure	
Cooler temperature $\leq 6^{\circ}\text{C}$				review completeness requirement	
Samples arrived intact and without air bubbles	X			review/revise handling procedure	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information		X			none; methane hit below detection limit (J flagged) for both method blanks
Method blanks are non-detect?				Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
At least 1 method blank was analyzed per sample set?	X				
Samples do not contain detectable analytes found in method blanks?		X			none; samples contain detectable methane, but methane in method blanks hit below detection limit
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have $\text{RPD} < \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	11-Aug-08	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:	N/A	CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:	N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:		N/A - not applicable
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R2845077	CoC No: -
Completed by: M. Watling	Date: 17-Nov-2008

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	X				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?		X			none; %R for vinyl chloride was above QC limits for both MS and MSD but LCS had %R within QC limits
Field replicates have RPD $< \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	QL - quantitation limit (or reporting limit)
Date of first lab report: 11-Aug-08	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested: N/A	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received: N/A	%R - percent recovery
Revisions - Date and nature of revisions requested:	N/A - not applicable
Revisions Received:	
Date of receipt of correct and complete lab report:	

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R0901192	CoC No:
Completed by: E. Ney	Date: 7 July 09

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	N/A				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	N/A			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	
Date of first lab report:	3/16/2009
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Date of receipt of correct and complete lab report:	

QL - quantitation limit (or reporting limit)
MS/MSD - matrix spike/matrix spike duplicate
CoC - chain-of-custody
RPD - relative percent difference
%R - percent recovery

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: RO901263	CoC No:
Completed by: E. Ney	Date: 6 Jul 2009

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	N/A				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present				Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	N/A			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	
Date of first lab report:	30/3/2009
Revisions - Date and nature of revisions requested:	MS/MSD - matrix spike/matrix spike duplicate
	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Date of receipt of correct and complete lab report:	

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: RO901263	CoC No:
Completed by: E. Ney	Date: 6 Jul 2009

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	N/A				
Surrogate recoveries meet QC acceptance criteria?		X			PMW-6(surrogate toluene-d8) %Rec = 84 limits 88-124, Matrix interference suspect
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	30/3/2009	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:		CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:		%R - percent recovery
Revisions - Date and nature of revisions requested:		
Revisions Received:		
Date of receipt of correct and complete lab report:		

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: RO901288	CoC No:
Completed by: E. Ney	Date: 7 Jul 09

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	N/A				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	X				
Field replicates have RPD $<$ or $= 20\%$?		X		review for possible sampling or analysis method revision(s)	Field Dup RPD's for Ethane, Ethene, and Methane are $> 20\%$
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	
Date of first lab report:	31/3/09
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Date of receipt of correct and complete lab report:	

QL - quantitation limit (or reporting limit)
MS/MSD - matrix spike/matrix spike duplicate
CoC - chain-of-custody
RPD - relative percent difference
%R - percent recovery

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R0901288	CoC No:
Completed by: E. Ney	Date: 7 Jul 09

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	N/A				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added, %R and RPD present	X			Lab to complete or correct lab report.	$\leq 20\%$
MS/MSD meet QC acceptance criteria?		X			MS/MSD = 66/59 (%Rec limits 70-130) not met for VC; MSD = 68 (%Rec limits 70-130) not met for cis-DCE.
Field replicates have RPD $<$ or $= 20\%$?	X			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	N/A			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	N/A			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Chronology of Lab Report Revisions	Notes:
Date of first lab report: 3/31/2009	QL - quantitation limit (or reporting limit)
Revisions - Date and nature of revisions requested:	MS/MSD - matrix spike/matrix spike duplicate
	CoC - chain-of-custody
Revisions Received:	RPD - relative percent difference
Revisions - Date and nature of revisions requested:	%R - percent recovery
Revisions Received:	
Date of receipt of correct and complete lab report:	

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R0901391	CoC No:
Completed by: E. Ney	Date: 8 Jul 09

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment		X		review/revise handling procedure	Samples R0901391-001-010 were 48 hrs in transit; 011-019 24 hrs in transit
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times		X			ML7-7 Acetylene reanalyzed 17 days from collection to obtain lowest possible detection limits.
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	N/A				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added, %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $<$ or $\approx 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	4/3/2009	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:		CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:		%R - percent recovery
Revisions - Date and nature of revisions requested:		
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R0901391	CoC No:
Completed by: E. Ney	Date: 8 Jul 09

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment		X		review/revise handling procedure	Samples R0901391-001-010 were 48 hrs in transit; 011-019 24 hrs in transit
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	N/A				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	X				
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	N/A			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	
Date of first lab report:	4/3/2009
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Date of receipt of correct and complete lab report:	

QL - quantitation limit (or reporting limit)
 MS/MSD - matrix spike/matrix spike duplicate
 CoC - chain-of-custody
 RPD - relative percent difference
 %R - percent recovery

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R0901473	CoC No:
Completed by: E.Ney	Date: 8 Jul 09

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$		X		review/revise handling procedure	Cooler temp = 5 degrees C
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	N/A				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions		QL - quantitation limit (or reporting limit)
Date of first lab report:	2 Apr 09	MS/MSD - matrix spike/matrix spike duplicate
Revisions - Date and nature of revisions requested:		CoC - chain-of-custody
		RPD - relative percent difference
Revisions Received:		%R - percent recovery
Revisions - Date and nature of revisions requested:		
Revisions Received:		
Date of receipt of correct and complete lab report:		

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R0901473	CoC No:
Completed by: E.Ney	Date: 8 Jul 09

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$		X		review/revise handling procedure	Cooler temp at 5 degrees C
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	N/A				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	X			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	X			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?		X			PCE MS/MSD = 120,122 (% Rec limit = 80-120) RPD = 2
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	N/A			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	
Date of first lab report:	2 Apr 09
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Date of receipt of correct and complete lab report:	

QL - quantitation limit (or reporting limit)
 MS/MSD - matrix spike/matrix spike duplicate
 CoC - chain-of-custody
 RPD - relative percent difference
 %R - percent recovery

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R0901566	CoC No:
Completed by: E.Ney	Date: 8 July09

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	N/A				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $<$ or $= 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	N/A			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	
Date of first lab report:	14 Apr 09
Revisions - Date and nature of revisions requested:	MS/MSD - matrix spike/matrix spike duplicate
	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Date of receipt of correct and complete lab report:	

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R0901566	CoC No:
Completed by: E.Ney	Date: 8 July09

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles		X		review completeness requirement	Receipt log indicates 3rd vial of TB with Air Bubbles
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided				Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	N/A				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions
Date of first lab report: 14 Apr 09
Revisions - Date and nature of revisions requested:
Revisions Received:
Revisions - Date and nature of revisions requested:
Revisions Received:
Date of receipt of correct and complete lab report:

QL - quantitation limit (or reporting limit)
 MS/MSD - matrix spike/matrix spike duplicate
 CoC - chain-of-custody
 RPD - relative percent difference
 %R - percent recovery

DATA VALIDATION CHECKLIST - GENERIC

Lab Report No: R0901587	CoC No:
Completed by: E. Ney	Date: 8 Jul 09

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were extracted/digested (if applicable) and analyzed within holding times	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples	X			Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified				Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable analytes found in method blanks?	N/A				
Laboratory control samples, duplicates, and spikes meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $<$ or $= 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	N/A			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	N/A			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	
Date of first lab report:	4/14/2009
Revisions - Date and nature of revisions requested:	MS/MSD - matrix spike/matrix spike duplicate
	CoC - chain-of-custody
	RPD - relative percent difference
Revisions Received:	%R - percent recovery
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Date of receipt of correct and complete lab report:	

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: R0901587	CoC No:
Completed by: E. Ney	Date: 8 Jul 09

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples				Lab to complete or correct lab report QA/QC Officer review/revise analytical method	
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	N/A				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?	N/A			review for possible sampling or analysis method revision(s)	
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	N/A			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	
Date of first lab report:	4/14/2009
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Date of receipt of correct and complete lab report:	

QL - quantitation limit (or reporting limit)
MS/MSD - matrix spike/matrix spike duplicate
CoC - chain-of-custody
RPD - relative percent difference
%R - percent recovery

**DATA VALIDATION CHECKLIST
FOR VOC DATA (EPA METHOD 8260)**

Lab Report No: H9C19110	CoC No:
Completed by: E. Ney	Date: 8 Jul 09

Item	True	False	Required Action if False		Action Taken
			Data Qualification	Corrective Action	
Chain of Custody					
Cooler temperature $\leq 6^{\circ}\text{C}$	X			review/revise handling procedure	
Samples arrived intact and without air bubbles	X			review completeness requirement	
Signature(s) and name(s) of recipient for lab provided	X			Lab to complete or correct CoC	
Date & time of receipt by lab provided	X			Lab to complete or correct CoC	
Samples arrived within 24 hours of shipment	X			review/revise handling procedure	
Holding Times					
Samples were analyzed within 14 days of collection	X				
Quantitation Limits					
QLs do not exceed SAP Table B-2, except for diluted samples		X		Lab to complete or correct lab report QA/QC Officer review/revise analytical method	Lab reports elevated reporting limits due to difficult sample matrix.
QLs adjusted for dilutions	X			Lab to complete or correct lab report	
Dilutions specified	X			Lab to complete or correct lab report	
Lab QA/QC Information					
Method blanks are non-detect?	X				
At least 1 method blank was analyzed per sample set?	X			Lab to complete or correct lab report. If still false, QA/QC Officer to review with lab.	
Samples do not contain detectable VOCs found in method blanks?	N/A				
Surrogate recoveries meet QC acceptance criteria?	X				
Field QA/QC Information					
Samples collected as per protocols in SAP?	X			QA/QC Officer to review/revise sampling protocols	
Samples collected as per frequency criteria in SAP?	X			QA/QC Officer to review/revise sampling protocols	
MS/MSD data presented are for site or project relevant samples	N/A			Ignore results if not site or relevant samples	
MS/MSD pre-spike concentration, amount added. %R and RPD present	N/A			Lab to complete or correct lab report.	
MS/MSD meet QC acceptance criteria?	N/A				
Field replicates have RPD $< \text{or} = 20\%$?		X		review for possible sampling or analysis method revision(s)	sampling methods reviewed; no issued found
Trip blanks are ND?	X			review/revise handling procedures if necessary	
Equipment blanks are ND?	N/A			review/revise cleaning procedures if necessary	
Case Narrative					
Completely addresses any lab QC results outside QC limits	X			Lab to complete or correct lab report	
Other					
Data qualifiers used in lab report are explained in lab report	X			Lab to complete or correct lab report	
Electronic data match the lab report	X			Resolve which is incorrect and correct	

Notes:

Chronology of Lab Report Revisions	
Date of first lab report:	3/31/2009
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Revisions - Date and nature of revisions requested:	
Revisions Received:	
Date of receipt of correct and complete lab report:	

QL - quantitation limit (or reporting limit)
 MS/MSD - matrix spike/matrix spike duplicate
 CoC - chain-of-custody
 RPD - relative percent difference
 %R - percent recovery